

HEALTH ZONE

Core List

Vaccines

BY AMANDA DUCKWORTH



ANNE M. EBERHARDT

Most West Nile virus cases occur in unvaccinated horses

WHEN IT COMES TO VACCINATIONS, whether a horse requires a specific vaccine sometimes depends on its lifestyle; other times, it does not. Some diseases are so potent and yet preventable that the American Association of Equine Practitioners suggests all horses be vaccinated against them, while other diseases are a case-by-case basis. Understanding why certain horses need certain vaccines is important, and it is something horse owners should discuss with their veterinarians.

As a cornerstone, the AAEP has a core list of vaccines, which means they are recommended for all horses, regardless of where they live or whether they travel. These comprise Eastern and Western Equine Encephalomyelitis, rabies, tetanus, and West Nile virus.

“We tell our owners that they should at least give the five core vaccines,” said Dr. Dale Brown of Rood & Riddle Equine Hospital. “They should always give those because they are proven vaccines that have really high efficacy, and all of those diseases have severe side effects and can potentially be fatal.”

Five proven vaccines have high efficacy

The power of vaccines can be seen in WNV, which became headline news just before the new millennium, and according to the AAEP, is the leading cause of arbovirus encephalitis—inflammation of the brain—in horses and humans in the United States.

The virus was first identified in 1937 in the West Nile province of Uganda. How it came to North America remains a mys-

tery, but the first confirmed equine WNV cases on the continent, of which there were 25, occurred in New York in 1999. Then it began to spread, which is why developing a reliable vaccine became so critical.

More than 25,000 equine cases of WNV have been reported in the United States since 1999, and they are usually associated with unvaccinated horses.

“This virus has been identified in all of the continental United States, most of Canada, and Mexico,” explains the AAEP under its guidelines for core vaccinations. “West Nile virus is transmitted by many different mosquito species, and this varies geographically. The virus and mosquito host interactions result in regional change in virulence of the virus; therefore, no prediction can be made regarding future trends in local activity of the viruses.”

Clocking in at 96.9%, horses are overwhelmingly responsible for reported mammalian cases of WNV disease that are non-human, making it critical equines be vaccinated against the virus.

Horses that exhibit clinical signs of WNV face an uphill battle to recovery. Data show that the disease proves fatal in approximately 33% of horses while another 40% exhibit residual effects that can include both behavioral and gait abnormalities.

“We recommend WNV because it is pretty much across the entire United States at this point,” said Brown. “It is highly recommended that you vaccinate against it. It is labeled as a once-a-year vaccine, but in the heavily problematic areas, it is pretty common for horses to get boosters. So, if they get done in the spring when mosquito season first starts, they get boosters again in the fall.”

The first WNV vaccine was conditionally approved by the United States Department of Agriculture in 2001, two



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MESSAGE FROM THE GRAYSON-JOCKEY CLUB RESEARCH FOUNDATION

VIRUS ABORTION VACCINE DEVELOPED BY GRAYSON FUNDING

BY EDWARD L. BOWEN



Grayson-Jockey Club
Research Foundation

A SOURCE OF SATISFACTION for the Grayson-Jockey Club Research Foundation is that the vaccine for virus abortion was developed with the assistance of funding from the original Grayson Foundation during the 1970s. Existence of any vaccine against what was once a serious and deadly scourge of man or beast is a welcome and ongoing benefit. There is also an ongoing need for vigilance, however, and in the case of virus abortion in mares, complacency still must be avoided.

For Dr. Luke Fallon of the renowned Hagyard Equine Medical Institute, the development of the vaccine and the history of the malady have personal as well as professional ties. It was Dr. Jack Bryans, Fallon's uncle, who was the mainstay of the University of Kentucky's research team that developed the vaccine. Moreover, Fallon's father (whose sister was Bryan's spouse) was Dr. Ed Fallon, who was of the generation bedeviled by virus abortion as young veterinarians and later grateful for the vaccine for the remainder of their careers. The cooperative efforts between the researchers and farm practitioners were vital in the vaccine becoming a reality.

Fallon's memory of his father's tales about the "old days" includes such cases as one boarding farm suffering abortion in 18 of the 20 mares it kept for a single patron. It is no wonder that the word "outbreak" is not sufficient in expressing the depth of the problem. The common term is "abortion storm." The villain of virus abortion in mares is a specific herpes virus, identified as Equine Herpes Virus 1 (EHV-1). In 2019, EHV-1 is known and feared for its role in outbreaks that have forced quarantines at racetracks and canceled horse shows.

Scientific research might have belled

the cat insofar as the abortigenic aspect of EHV-1 is concerned, but the virus still harries the horse world, particularly as it pertains to neurologic disease. Fallon points out that EHV-1 is only one of multiple EHV types that can result in significant disease. In addition to reproductive disease in mares, EHV-4 and EHV-1 viruses can result in respiratory disease, specifically in young horses. A form of reproductive pox caused by EHV-3 can shut down a stallion for brief periods. Research on these has high priority today.

The virus that causes abortion was not banished from existence by the development of the vaccine Zoetis Pneumabort-K (R). Fallon pointed out that many mares still, and always will, harbor the virus, so vaccination year after year is still essential. He said the standard sequence is to vaccinate during the fifth, seventh, and ninth months of any pregnancy.

The impact of the availability of an effective killed-virus vaccination seems virtually impossible to quantify, either in terms of dollars saved, i.e., NOT lost, or in decreased fears of, and anguish of, such a fundamental blow in the life of a breeding farm. The impact of the Mare Reproductive Loss Syndrome year of 2001 is accessible in the personal memories of many more

current horsemen/horsewomen than are virus abortion storms and can be a useful frame of reference.

While the mechanism of MRLS abortions was not the same, the rapid sweep of tragic news across the Central Kentucky Thoroughbred community is instructional. What if one were always aware that a similar sequence of devastation was perhaps lurking out there—in this year, on this farm? Welcome to the not-so-distant past.

The sequence of vaccination involves the seemingly perverse notion to "infect with a killer virus in order to prevent death from that same virus." A small amount awakens a strengthened immunity, which fights off that same antagonist. So, the incidence of virus abortions of one year could actually impart some increase in immunity for the next year. This might affect immunity within the herd for as long as five years.

Fallon likened the syndrome to "chickenpox in children," although caused by a different virus. The open sores on one child can "cross-inoculate" other children with which he/she comes into contact.

Conversely, while the above case might involve positive reactions, Fallon cautioned against rotating between vaccinated mares and younger horses, such as yearlings, in the same stalls. Even a vaccinated mare possibly could be caused to abort because of minute environmental issues left by the young horses recently contending with their own developing immunity.

Again, virus abortion has not been conquered, but our current vaccination protocols attenuate this risk. **BH**

years after its devastating effects began to impact the country.

“Fort Dodge was the first to come out with one, and it was actually just a conditionally licensed vaccine at the time because it hit in such a hurry,” said Brown. “Everyone was in a panic, so people started using it before all of the formal testing had been completed.”

The USDA-Animal and Plant Health Inspection Services Center for Veterinary Biologics issued a full license for the equine WNV vaccine in 2003. According to efficacy study results submitted to the USDA, 95% of the horses vaccinated with two doses and challenged with live virus 12 months later remained free of infection.

“Since then, there are now four companies that make a WNV vaccine,” said Brown. “It is a highly, highly efficacious vaccine.”

Of the four USDA-approved vaccines, one is a non-replicating live canary pox recombinant vector vaccine, another is an inactivated flavivirus chimera vaccine, and two are inactivated whole WNV vaccines. Although they conquer WNV in different ways, all four of them have proved to be reliable and safe.

“They have all been tested and licensed,” said Brown. “They are all safe for use and they are all effective, so it is purely up to the veterinarian’s and owner’s discretion as to which one they choose to use.”

“We still get cases, even in Kentucky, every year that you see and hear about, but those are notoriously non-vaccinated horses,” Brown continued. “We can’t guarantee prevention of the disease, but it is a very efficacious vaccine. If it is handled correctly and given appropriately, it’s very efficacious in, at the very least, decreasing the severity of the disease and most of the time in preventing it. Why put them at risk by not vaccinating?”

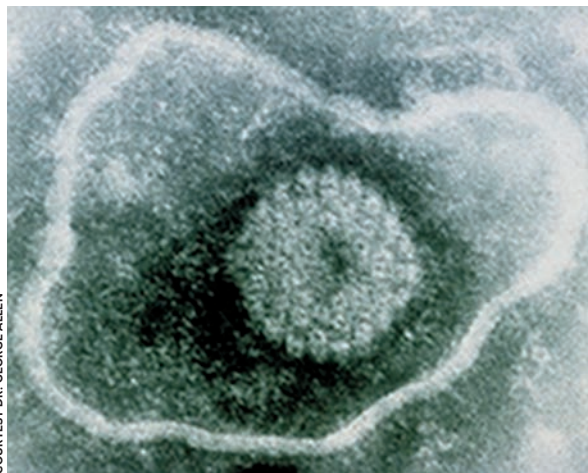


COURTESY, ROOD & RIDDLE

Rood & Riddle Equine Hospital’s Dr. Dale Brown

HERPES

While the available vaccines for WNV have the virus covered when administered correctly, not all diseases are so easily tamed. Herpes is another issue that equines find themselves susceptible to, and, in fact, it is estimated equine herpesviruses are found in most horses the world over.



COURTESY DR. GEORGE ALLEN

A microscopic view of equine herpes virus

Although almost all horses have been infected with some form of the virus, most of them do not suffer any serious side effects. However, for horses in certain living situations, it is still highly recommended owners vaccinate against EHV while also understanding the

limitations of current vaccines.

“It is an important vaccine to give in highly populated areas of horses and also with horses that do a lot of traveling and are mingled with other populations of horses,” said Brown. “Herpes is everywhere. Almost every horse has been exposed to herpes at some point in its life, and it lies dormant in the horse’s body. Then it starts shedding during stressful events like showing and transport.”

“Mostly, the purpose of the vaccine is to decrease the amount of the shedding of the virus into the environment. The biggest reason to vaccinate your horse is to protect it from other horses that are shedding the virus.”

Thoroughbreds obviously fit the description of horses that travel and that interact with other populations of horses. It is also common to vaccinate broodmares against EHV because of one of the biggest known issues with the virus is abortions.

Worldwide, nine different EHV’s have been identified, with EHV-1, 3, and 4 posing the most risk. EHV-1 in particular is of concern to broodmare bands.

“EHV is a common DNA virus that occurs in horse populations worldwide,” explains the AAEP. “The two most common species are EHV-1, which causes abortion, respiratory disease, and neurologic disease; and EHV-4, which usually causes respiratory disease only but can occasionally cause abortion and rarely neurological disease.”

Part of the high concern surrounding EHV-1 is that it is contagious and easily spread by direct horse-to-horse contact, thanks to nasal secretions. The virus can also be transferred indirectly through contact with objects that have been contaminated.

“Unfortunately, the herpes vaccines, no matter which company makes them, are a very short-term immunity build up,” said Brown. “You have to vaccinate horses at least three to four times a year. The antibodies produced against that vaccine just don’t last for a long period of time.”

“Breeding farms mostly use it every

HEALTH ZONE

Vaccines

60-90 days. It is recommended for gestational mares and given at months five, seven, and nine. Most of the farms around here give it every 60 days, year-round so there's never a lapse.”

When selecting the proper herpes vaccine for a horse, it is important to work with a veterinarian. Because the virus can cause different issues, different vaccines work in different ways.

There are a variety of inactivated vaccines available. Some are licensed only for protection against respiratory disease while several others are licensed to protect against both abortions and respiratory issues.

“Performance of the inactivated respiratory vaccines is variable, with some vaccines outperforming others,” according to the AAEP. “Performance of the inactivated abortion/respiratory vaccines is superior, resulting in higher antibody responses and some evidence of a cellular response to vaccination.”

Additionally, there is one licensed modified live EHV-1 vaccine available, and it is used as an aid in preventing respiratory disease caused by EHV-1.

However, it is important to realize that none of the available vaccines are labeled as effective against the neurologic form of the disease, known as equine herpesvirus myeloencephalopathy.

“EHM results from widespread vascular or blood vessel injury after damage to the lining of the blood vessels of the blood-



EDWARD WHITAKER

A sample of flu vaccines for equines

brain barrier,” according to the AAEP. “Neurologic signs result from inflammation of the blood vessels, blood clots, and death of neurologic tissue. Cases of EHM occur singly or can affect multiple exposed horses. They may or may not be associated with a previous or ongoing EHV-1 respiratory or abortion disease outbreak.

“If EHM is present on a farm, then the risk to other horses at that farm is greatly increased. Stringent quarantine and biosecurity procedures must be implemented immediately. Unfortunately, none of the current EHV-1 vaccines carry a label claim for prevention of EHM. More research is needed to identify a vaccine that may prevent this form of the disease.”

This lack of a vaccine is something veterinarians are keenly cognizant of, and in May 2018 the Animal Health Trust (AHT) in England announced it was embarking on long-term vaccine development research project centered around equine herpes.

The goal of the five-year research program is aimed at designing a modified live virus vaccine that is more efficacious when it comes to protecting against abortion, neonatal foal death, and, for the first time, neurological disease.

“We have become aware of a pressing need for progress toward a new and improved EHV-1 vaccine,” said Dr. Neil Bryant of the AHT. “EHV is a major welfare concern for horses and foals and causes emotional as well as financial strains on horse owners and breeders around the world. It can strike any horse at any time, so a vaccine will be of global welfare benefit to all horses, including the Thoroughbred and sport horse breeding industries, and would help control this serious and sometimes fatal disease.”

Such an undertaking requires money, and the desire for a better vaccine is perhaps highlighted by the high-profile names of those who helped provide funding, including the Alborada Trust, Coolmore Ireland, EBM Charitable Trust, Juddmonte Farms, the Levy Board / Racing Foundation, Niarchos (London), Newsells Park Stud, Paul Mellon Foundation, Thompson Family Charitable Trust, and the Thoroughbred Breeders' Association.

Finding better vaccines benefits everyone, but as the difference between the WNV vaccines and the herpes vaccines shows, some diseases remain trickier than others. **BH**

Amanda Duckworth is a freelance writer based in Lexington.

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