

PREVENTION OF WEST NILE VIRUS INFECTION

(Adapted from AAEP Vaccination Guidelines)

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West Nile Virus (WNV) is now established in all areas of the mainland USA and Canada and is causing disease and death in horses. Horses in all areas are at risk of becoming infected and this risk will continue in coming years with a pattern reflecting the seasonal and geographic variation in the distribution of insect vectors and avian reservoirs of the virus. In general, the highest risk of infection coincides with the months during which mosquito activity is highest, typically July, August, September, and October in most states, including California. However, cases have occurred in all months of the year in areas with year-round mosquito activity. A three-pronged approach is recommended to minimize the risk that horses will become infected with WNV:

1. ***Vaccinate all horses against WNV to increase resistance***
2. ***Reduce mosquito numbers***
 - a. Eliminate stagnant or standing water, for instance by draining ponds, avoiding water overflow from troughs, reducing run-off and pooling of irrigation water, eliminating accumulated water in flower pot saucers, and removing old tires and other areas in which water can collect.
 - b. Set out mosquito traps.
 - c. Stock ponds, troughs, fountains and other areas of standing water with mosquito fish or add mosquito dunks to kill mosquito larvae.
 - d. Eliminate piles of decaying organic matter such as leaves, lawn clippings and manure.
 - e. Cooperate with County Mosquito Control Districts as they institute aerial spraying and other mosquito control measures.
3. ***Reduce exposure of horses to infected mosquitoes***
 - a. Keep horses in a barn from dusk to dawn (the time of peak mosquito feeding activity).
 - b. Use fans to keep air moving in barns.
 - c. Apply mosquito repellants approved for use in horses, particularly in the evening.

Guidelines for WNV Vaccination of Horses

Two commercially available licensed vaccines (West Nile Innovator™, Fort Dodge Animal Health and Recombitek®, Merial) are available for use in horses and have been shown to reduce the risk of disease and mortality associated with WNV infection, although clinical disease may not be fully

prevented. The West Nile Innovator™ vaccine is inactivated (killed) and is available as either a monovalent (single component) or as a multivalent vaccine along with other encephalitis viruses (EEE and WEE) and tetanus. The Merial Recombitek® vaccine is a modified live, canarypox-vectored recombinant vaccine. Both vaccines have met USDA requirements for safety testing. In challenge models, both have been proven to significantly reduce the magnitude of viremia (amount of virus circulating in the blood) in experimentally infected vaccinated horses compared to non-vaccinated control horses for as long as 12 months after primary vaccination with two doses of vaccine. Extensive use in the field confirms the efficacy of these vaccines.

A. Primary vaccination of non-vaccinated horses

Directions for both vaccines include administration of 2 doses of vaccine 3 to 6 weeks apart (consult the specific label). Optimal protection cannot be expected until 2 weeks after administration of the second dose of vaccine, although experimental studies with the Recombitek® vaccine have documented reasonable protection as early as 26 days after administration of the first dose.

B. Revaccination of previously vaccinated horses

Revaccination of previously vaccinated horses is recommended by the vaccine manufacturers on an annual basis or more frequently when local conditions are conducive to a prolonged period of potential exposure to infected mosquito vectors. During 2004 and 2005, cases of WNV infection in horses occurred in California from early June through early November. Annual revaccination is, therefore, best completed in the Spring (March through mid-April), prior to the onset of the insect vector season. Field experience suggests that acceptable protection can be accomplished with this approach. Considering that the mosquito season in most areas of California is prolonged, revaccination twice annually, once in the Spring and again in the late Summer or early Fall (late July through early September), may further enhance the level of protection achieved by vaccination.

C. Vaccination of mares

Neither of the licensed West Nile vaccines carry label recommendations for administration to pregnant mares; therefore, it is recommended that mares be vaccinated before breeding whenever possible. However, it is well recognized that pregnant mares are at risk of acquiring infection from infected mosquitoes. Consequently, it has become accepted practice by many veterinarians to administer vaccines to pregnant mares on the reasonable assumption that the risk of adverse consequences of WNV infection far exceeds the potential adverse effects of use of vaccines in pregnant mares. Indeed,

the safety of the inactivated WNV vaccine in pregnant mares has now been established in a published study. As with other vaccines, it is prudent to avoid administering vaccines to mares during the first 60 days of gestation if possible. Booster vaccination of pregnant mares, 4 to 6 weeks before foaling, is recommended and provides their foals with passive colostrum protection that lasts 3 to 4 months.

D. Primary vaccination of foals

In contrast to the findings with many equine vaccines, maternally-derived antibodies do not exert a significant inhibitory effect on the response of foals as young as 3 months of age to either of the WNV vaccines currently marketed in North America. Therefore, **primary vaccination of foals from properly vaccinated mares** should be started by administration of the first dose of vaccine at 3 to 4 months of age, followed by a second dose approximately 1 month later, and a third dose, 8 to 12 weeks after the second dose. This 3rd dose increases the likelihood that foals with high levels of maternal antibody that may have blocked the response to the first dose of vaccine, will become primed and protected. A booster should be administered during the Spring of the yearling year, after which the recommendations for vaccination of adult horses should be followed.

Primary vaccination of foals from non-vaccinated, non-exposed mares should commence at 3 to 4 months of age or younger (as early as 1 month of age), depending on month of birth and seasonal level of activity of mosquito vectors in the area. The 3-dose primary vaccination protocol outlined above should be followed.

E. Vaccination of previously infected, recovered horses

The duration of resistance following recovery from natural infection with WNV is unknown; therefore, definitive recommendations for vaccination of horses that have recovered from WNV infection cannot be made at this time. However, it is reasonable to expect that immunity following natural infection will last at least one year and that recovered horses can be placed on the same revaccination program as other horses in the herd at that time.