Serologic Responses of West Nile Virus Sero-Negative Mature Horses to West Nile Virus Vaccines

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Inclusion of West Nile virus (WNV) with equine encephalitis viruses and tetanus in vaccines has a detrimental impact on WNV antibody production. To maximize the humoral immune response against WNV, monovalent WNV vaccines should be considered. Author’s address: 12685 McIntyre Creek Road, Olsburg, KS 66520; e-mail: Kevin.hankins@zoetis.com. © 2013 AAEP.

1. Introduction
The first vaccine against West Nile virus (WNV) was licensed as a monovalent viral inactivated vaccine. Since then, incorporation of the WNV antigen in multivalent vaccines has become common. This study was conducted to assess, under field use conditions, the impact on serological response of three commercially available WNV vaccines either given as a monovalent injection or as a multivalent WNV vaccine incorporated with equine encephalitis and tetanus vaccine.

2. Materials and Methods
Two hundred forty mature, WNV sero-negative (less than four) horses were followed serologically before and after primary and secondary vaccination with six different vaccination programs, all including WNV antigens. Forty horses were left as unvaccinated sentinel horses.

3. Results
All vaccines stimulated both a primary and secondary (booster) response to vaccination that was significantly higher than sero-negative controls. However, inclusion of WNV with equine encephalitis viruses and tetanus toxoid in vaccines had a significant detrimental impact on WNV serum neutralization antibody production to both the primary and secondary vaccinations.

4. Discussion
This study showed that West Nile monovalent vaccines stimulated a 2- to 3-fold increase in the serologic response to WNV compared with West Nile multivalent vaccines incorporated with equine encephalitis and tetanus. The impact of the dramatic differences seen in post-vaccination WNV titers on protection in the horse is not known. Several studies have demonstrated the correlation between antibodies against WNV and protection against challenge. One author suggested the use of post-vaccination WNV antibody levels as a determinant of duration of immunity. These studies suggest that antibodies may play a role in speed of onset, level, or duration of protection against WNV infection.