

With this issue of the New Jersey Horse Health News, we usher in our second experience with West Nile Virus. Fortunately, we had all winter to prepare for this eventuality, but we need everyone's cooperation to minimize the impact of this virus in humans and horses. The recommendations we have provided are easy to implement and will help decrease the mosquito population in New Jersey. This issue also focuses on other diseases affecting New Jersey horses, Eastern Equine Encephalitis and Equine Influenza. For additional information about these or other diseases, contact your veterinarian or call us at 609-292-3965. Suggestions and comments are always welcome!

Keeping You Informed...

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water troughs of all kinds, water/feed buckets, wash stall drains, wheelbarrows, stagnant ponds, unwashed birdbaths, plastic wading pools and unused swimming pools.

- Keep buckets, basins, gutters, drains and pools clean and debris-free.
- Turn over wheelbarrows, wading pools and other water-collecting equipment when not in use.
- Drill holes in the bottom of containers that cannot be discarded and must be left outdoors.
- Clean and maintain swimming pools regularly.
- Use landscaping to eliminate standing water that collects on the property.
- Consult with your County Mosquito Agency and request a site visit to identify areas of concern, get suggestions for clean-up/treatment and identify possible sites for mosquito collection and testing.

Concentrate on these recommendations instead of using things like fly sheets and masks, repellents for long term control, fly

misters and bug zappers which are minimally effective mosquito control measures.

Horses can be sensitive to infection from WNV. **Early detection and immediate intervention may save your horse's life! Don't hesitate. Call your vet if your horse is exhibiting any of the following clinical signs:** anorexia (off feed), depression or listlessness, weakness of hind limbs, flaccid paralysis of the lower lip (droopy lip), impaired vision, ataxia (difficulty moving or standing correctly), head pressing, aimless wandering, convulsions, inability to swallow, circling, hyper-excitability, paresis (paralysis, complete or partial).

STAY IN TOUCH!!

- Call your local Department of Health to report affected wild birds.
- Call your physician if you have concerns about your OWN health.
- Call your small animal veterinarian with questions about your dogs or cats. Small animals may become infected with WNV, but rarely suffer any ill effects from that infection. The Division of Animal Health Laboratory can test your pet's blood if your veterinarian determines that a current illness is likely the result of WNV infection. ☺

What Can You Use Instead of Old Tires?

Old tires pose a huge threat this year, since they play a role in the perpetuation of West Nile Virus in the environment. Water that accumulates in these tires serves as the ideal habitat for mosquito breeding. Drilling holes in the tires will not eliminate all the water that accumulates, making this environment perfect for mosquitoes. Farmers and other property owners often use old tires to hold down tarps and other equipment on farms. We thought that together we could come up with some good alternatives for this use that will help farms keep their crops and feed covered appropriately, without using tires. Call, write, email or fax us with your ideas — it may save lives.

Phone 609-292-3965, Fax 609-777-8395, Email aghhalp@ag.state.nj.us
Write Nancy E Halpern, DVM, Assistant Director,
Division of Animal Health, PO Box 330, Trenton, NJ 08625

Let us know that you're contacting us about this issue by mentioning 'tire solution' as your subject. ☺



New Influenza Vaccine Hits New Jersey Market

A new vaccine, *Flu Avert™ I.N.*, produced by Heska,™ has recently been introduced to protect horses against influenza virus. The vaccine is given intranasally and may not be as familiar to horse owners as the more traditional, injected vaccines. We hope the following article answers many questions you might have about this new product.

What is influenza and why is it of concern for my horses?

Influenza is a highly contagious virus that attacks the upper respiratory tract of the horse. Clinical signs include fever, cough, nasal discharge, lack of appetite and depression. The influenza virus replicates in the respiratory epithelial cells, destroying vital tissue and cilia. Without the sweeping action of the cilia in the upper airway to trap contaminants, bacterial and viral pathogens can enter the lungs and cause severe disease.

The virus has a very rapid incubation period and is transmitted via aerosol droplets. One horse can infect an entire stable in a matter of days. Since it is a virus, antibiotics are useless in stopping the progression of disease. Typically equine practitioners will recommend one week of stall rest for each day of fever, which translates into serious down time. Therefore, the best method of treatment is prevention with a protective vaccine.

Has a vaccine been available before?

The only vaccines that have been available in the past were of the killed-virus, injectable type. However, there have been several well-documented breaks in their protection. A recently published blind field trial involving 450 Thoroughbred racehorses demonstrated poor antibody response and a lack of protection following vaccination with a killed vaccine.¹

The immune response generated by killed intramuscular influenza vaccines is universally accepted to be inadequate and short-lived. Therefore, multiple vaccination boosters were given to try to stimulate an antibody response. Most importantly, the systemic antibody response does not necessarily correlate to protection since the virus enters the body through the mucous membranes of the horse's nose.

What is new about *Flu Avert™ I.N.* vaccine?

Flu Avert™ I.N. vaccine is the only intranasal influenza vaccine on the market. Because *Flu Avert™ I.N.* is administered in the horse's nose, there is no risk of injection site reactions, stiffness or pain commonly associated with intramuscular vaccines. The mucous membranes of the nose provide the ideal delivery system for an upper respiratory vaccine. Upon contacting the nasal mucosa, *Flu Avert™ I.N.* rapidly stimulates mucosal immunity at the site of a natural influenza infection.

The virus present in the vaccine has several modifications to ensure safety as well as efficacy. *Flu Avert™ I.N.* is the first cold-adapted intranasal influenza vaccine, which means it only grows at the cooler temperature of the horse's nasal passages. The virus contained in *Flu Avert™ I.N.* vaccine is also attenuated, which means it only contains the proteins that induce an immune response and it lacks the virulence factors that cause disease.

Efficacy is achieved through the use of a modified live-flu strain in the vaccine. *Flu Avert™ I.N.* vaccine has been clinically proven through challenge studies to provide effective immunity for up to six months with only a single dose of vaccine. In contrast, conventional killed-virus intramuscular flu vaccines require several boosters in the primary series.

How long has *Flu Avert™ I.N.* been available?

Heska Corporation, the company that manufactures the vaccine, received USDA approval in mid-November of 1999. Three research papers were presented on the safety and efficacy of the vaccine at the American Association of Equine Practitioners Annual Convention in Albuquerque, New Mexico, in December of that year.

Have there been any reported side effects?

As of May 21, 2000, after thousands of doses administered in the field, there have been a total of 10 incidents reported in vaccinated horses. In these incidents, diagnostic follow-up by an independent diagnostic laboratory identified a cause for the problem that was not related to vaccination with *Flu Avert™ I.N.* vaccine. However, based on these reports, it is recommended that you do not vaccinate a horse with both *Flu Avert™ I.N.* and *Pinnacle™* vaccines in the same nostril at the same time.

Why should I use this vaccine rather than the others?

According to the April 1999 issue of *The Horse* magazine, 63% of operations vaccinate for equine influenza, second in frequency only to tetanus. Yet, in a recent study conducted at Colorado State University, 66% of viral upper respiratory disease was linked to influenza despite strong vaccination efforts with killed-virus intramuscular vaccines.²

Flu Avert™ I.N. is the only equine flu vaccine in the country proven in challenge studies to protect against modern influenza strains. (The challenge model was designed to grossly exaggerate natural influenza infection by nebulizing live virulent viral particles into a plastic enclosed stall containing horses that were vaccinated with *Flu Avert™ I.N.* vaccine and unvaccinated controls.)

Flu Avert™ I.N. is the only flu vaccine proven in direct-exposure challenge studies to protect against Kentucky 98

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RUTGERS EQUINE RESEARCH UPDATES

Age Alters Cooling Ability in Horses During Exercise

With up to 15% of the equine population over 20 years of age, and many more in their late teens, the effects of advancing age on the health and performance of these horses during athletic activities is of concern to many horse owners. While human studies have investigated this question, no research to date has investigated the effects of aging on thermoregulation in horses. To this end, a recent study conducted at Rutgers tested the hypothesis that unfit old horses have a decreased ability to thermoregulate during exercise compared to young horses.

Six young (4-9 years) and five old (+20 years) unfit Standardbred mares were tested for their thermoregulatory ability using a steady state sub-maximal exercise test. The mares ran on a treadmill, up a fixed 6% grade, at a velocity calculated to generate a work rate of 1625 watts. The horses ran until core temperature reached 104°F. Core, skin, and rectal temperatures were measured every minute from time 0 until 10 minutes post-exertion. Jugular venous blood samples were collected prior to exercise and at 5 minute intervals until 10 minutes post-exercise and used to measure total blood lactate concentration, packed cell volume, and plasma protein concentration.

The significant finding of this study was that older horses exercising at the same absolute work intensity reached a internal body temperature of 104°F in almost half the time required by the younger mares. The heart rates of the older mares were also substantially higher than the heart rates of the younger mares at 104°F. Together, these data suggest that the older mares were not able to thermoregulate as effectively as the younger mares during exercise. However, data collected 10 minutes after exercise, to simulate a veterinary check, showed no differences between younger and old horses. This suggests that the old horses could cool out as effectively as young horses when not burdened by the extra demand of exercise.

Physiologically, the higher heart rates seen in the older horses at the same core temperatures indicated that the cardiovascular system of the older horses could not meet the combined demand of exercise and cooling. One explanation for this apparent compromised ability to dissipate heat is that older mares did not have enough cardiovascular reserve to supply blood flow to both the exercising muscles and to the skin during exercise. This age related difference in the ability of the heart to pump blood might have been due to either a decline in heart function or a difference in plasma volume and cardiac filling. Such is the case in older humans where lower plasma volumes mean less fluid for sweat production as well as cardiovascular performance.

Interestingly, a second study conducted at Rutgers demonstrated that the older horses indeed had substantially lower plasma volumes compared to the younger animals. Thus, a lower fluid reserve (plasma volume) and age-related decreases in heart function might explain the apparent age related differences in the ability to cool during exercise. These findings are important because many elite horses (three-day event, driving, dressage, hunter-jumpers, competitive trail rides) as well as pleasure horses compete into their late teens. Thus, recognizing that age affects thermoregulation during exercise may lead to improved practices to prevent heat stress during equine athletic activities.

Readers may contact Dr. McKeever c/o Dept. of Animal Science, Cook college, 84 Lipman Dr., New Brunswick, NJ 08901-8725 or McKeever@aesop.rutgers.edu. ☺

This Just In!

Eastern Equine Encephalitis (EEE):

The first case of EEE in 2000 occurred a NJ Gloucester County quarter horse in mid August. The 3 year old mare, unvaccinated, was euthanized after exhibiting neurologic signs consistent with EEE: stumbling, falling, inability to stand with an elevated temperature. Laboratory samples submitted to the Animal Health Lab yielded positive results. **It is important not to confuse EEE with West Nile Virus (WNV).** They are completely different diseases but share some characteristics — in both cases mosquitoes carry the virus to the host animal after feeding on infected wild birds and neither virus can be spread from horse to horse or from horse to human. **A significant difference between the viruses is existence of an effective vaccine for EEE but not for WNV.** State Veterinarian Dr. Ernest Zirkle urges horse owners throughout the Garden State to consult their veterinarians about the need to vaccinate their horses and other equids against Eastern equine encephalitis (EEE), **Horse owners should check their records to make sure that**

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FLU AVERT™ I.N.

How New Jersey Vets Rate the Latest Vaccine

New Jersey veterinarians, although innovative and forward thinking, also tend to be conservative about the incorporation of new vaccines and treatments in their practices. They often like to evaluate additional information about these products after they have been used in the field.

We thought it would be informative to ask them several questions about a new vaccine, Heska's *Flu Avert™ I.N.*, and provide feedback to you, the horse's caretaker, so you can make a better informed decision for the future. From the 28% of veterinarians who responded to our survey, here's what we heard:

- **Have you used Heska's new influenza vaccine, *Flu Avert™ I.N.*, in your practice?** Fully 58% of the respondents had ordered or used the vaccine.
- **Have you been satisfied with the ease and efficacy of use?** Of the vets who responded, 28% said yes; 14% said no because horses objected more to intranasal administration than to injections; and 14% either did not know or felt the administration of the vaccine could be improved. One respondent commented that he felt the vaccine had reduced the incidence of influenza in his patients and those that did get sick responded more quickly than expected.
- **In what age horse do you begin vaccinating against influenza?** Responses to this question varied based on the type of equine practice involved. Recommendations included three to four months; six to nine months; one year; and 20 to 24 months. The latter category included race horse practitioners, who typically first see horses at this age.

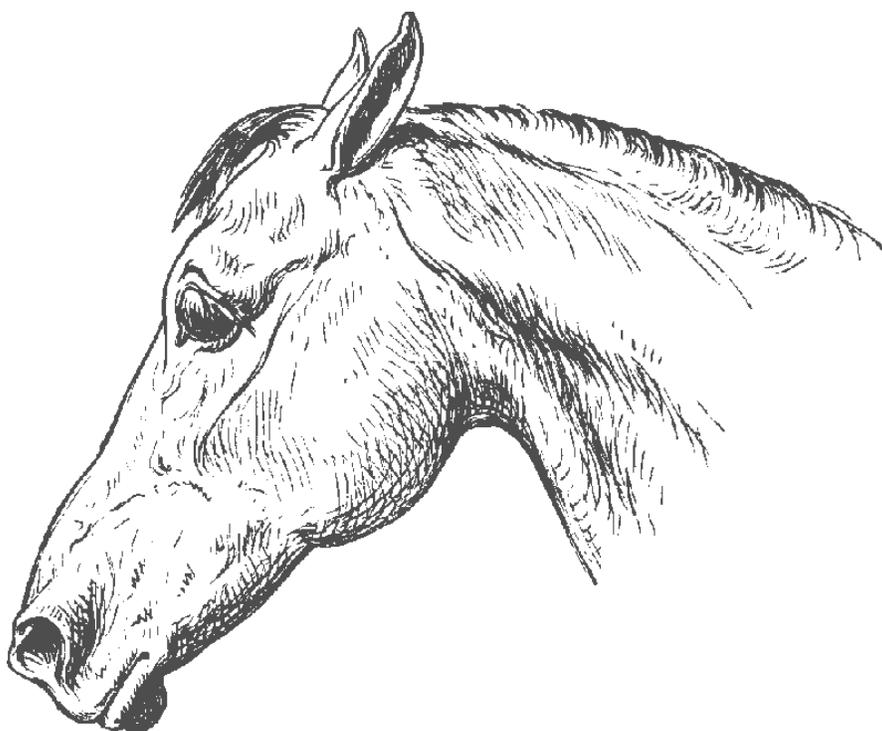
- **How often do you recommend re-vaccinating?** Recommendations were fairly consistent. Every two to three months for horses with high exposure and every four to six months for horses with minimal exposure.
- **Do you prefer to administer the vaccine yourself or do you feel comfortable dispensing it for clients to administer?** Almost all respondents administered the vaccine themselves. Many expressed concern about dispensing the vaccine to clients, although a few indicated they would, but only to selected clients. Their concern involved potential harm to the handler, based on the reactions they had observed among horses during vaccination.
- **Have you seen any side effects from the vaccine?** One-third of those responding had observed no side effects. One respondent reported that 5 to 10% of the horses had a mild nasal discharge after vaccination.



Eastern Equine Encephalitis (EEE)

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EEE vaccinations and boosters are kept up to date. **ANY HORSE THAT HASN'T RECEIVED A PRIMARY SERIES OR BOOSTER WITHIN THE LAST SIX MONTHS SHOULD BE GIVEN THE VACCINATION OR BOOSTER NOW.** EEE is commonly diagnosed in several equine cases in Southern Jersey beginning in late summer and ending after the frost. Wet, warm weather can result in an increase in the mosquitoes that carry this disease. No cases of the disease were reported in New Jersey last year, most likely because the severe drought interrupted mosquito breeding cycles. **Equine encephalitis is a reportable disease in NJ and must be reported to the Division within 48 hours.** ☺





Cape May County Horse Succumbs to West Nile Virus

First Confirmed Case of Virus in New Jersey Equine

September 5, 2000

Agriculture Secretary Art Brown, Jr. said today that the death last week of a six-year-old Thoroughbred gelding in Tuckahoe, Cape May County, has been attributed to infection with the West Nile Virus (WNV), in conjunction with other medical complications.

According to State Veterinarian Dr. Ernest Zirkle, the horse became ill on August 27, showing signs of neurological deficits, weakness, an elevated temperature of 104°F and difficulty rising, all possible signs of equine encephalitis. The horse had not left the farm for the past three months. The horse was euthanized on August 30.

Samples from the horse were tested at NJDA's animal health laboratory for both Eastern and Western equine encephalitis as well as equine infectious anemia and WNV. Because the animal had demonstrated some uncharacteristically aggressive behavior, the laboratory at the Department of Health and Senior Services (DHSS) also tested samples for rabies. Preliminary results from this group of tests revealed an elevated titer that was later confirmed as WNV by the National Veterinary Laboratory (NVSL) in Ames, Iowa.* Of the diseases tested for, the results confirmed the presence of WNV only.

Horses become infected with the WNV when infected mosquitoes bite them. The disease cannot be spread from horse to horse or from an infected horse to humans or domestic pets. Not all horses that contract WNV become ill.

This year, the first horse diagnosed with WNV was located on Staten Island. Since then, a horse in Rhode Island has been diagnosed with the disease.

Last week, DHSS revealed that a 43-year-old Jersey City man had tested positive for WNV. He is recuperating at home.

To date, 496 birds (495 crows and a cockatiel) found in 10 counties have tested positive for the presence of WNV. Positive birds have been found in Bergen (122), Essex (63), Hudson (48), Mercer (1), Middlesex (114), Monmouth (54), Morris (6), Passaic (36), Somerset (2) and Union (50) Counties. A total of 1,077 crows have been accepted for testing this year.

A total of five mosquito pools collected in Bergen County have tested positive for the presence of WNV. More than 1,400 mosquito pools from all 21 counties have been collected by the Rutgers Mosquito Research and Control Unit and tested by DHSS and/or the Centers for Disease Control and Prevention (CDC).

For more information on WNV or mosquito spraying, or to report dead birds and areas of standing water where mosquitoes breed, residents should call their local or county Departments of Health and mosquito control agencies or visit the web sites maintained by DHSS (www.state.nj.us/health), DEP (www.state.nj.us/dep/mosquito), the CDC (www.cdc.gov), and NJDA (www.state.nj.us/agriculture/westnile.htm). ↩

*Tests reported by NVSL included a strongly positive capture ELISA WNV IgM, indicating recent exposure to the virus; a positive RT-PCR test (reverse transcriptase polymerase chain reaction) identifying WNV RNA sequences in the brain of the horse; and a specific WNV antibody response as demonstrated by PRNT (plaque reduction neutralization test).



New Vaccine...

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influenza virus, the most recent flu strain isolated in the field at the time. It protects horses from the Eurasian strain of flu as well. *Flu Avert™ I.N.* simply provides better protection with fewer doses than conventional vaccines.

Who should administer the vaccine?

Heska™ *Flu Avert™ I.N.* vaccine is only available through licensed veterinarians. After consulting your equine practitioner, he/she may choose to administer the vaccine or leave the doses with the equine caretaker.

When should it be used?

How often?

Horses at highest risk, for example younger horses (yearlings and two-year-olds) and horses traveling or competing extensively, should be vaccinated every three to six months, depending on risk of exposure. Older horses or horses on farms not frequently encountering new pasture mates should be given *Flu Avert™ I.N.* every six months. A common recommendation for foals is that their first dose be given at seven months with a booster at 11 months.³

Are there any complications or side effects?

In extensive field studies, the only observed side effect was a slight clear nasal discharge following vaccination in just over 1% of the horses. This discharge was the same as that seen in normal horses during variable environmental conditions and resolved in a short time with no additional treatment. ↩

¹ Morley PS, Townsend HGG, Bogdan JR, *et al.*: Efficacy of a commercial vaccine for preventing disease caused by influenza virus infection in horses. *JAVMA*, Vol. 215, No. 1, Pp 61-66, July 1, 1999.

² Mumford EL, Traub-Dargatz JL, Salman MD, *et al.*: Monitoring and detection of acute viral respiratory tract disease in horses. *JAVMA*, Vol. 213, No. 3, Pp 385-390, Aug 1, 1998.

³ Dr. Robert E. Holland, DVM, PhD, Lexington, KY.