

Zoonotic Disease Newsletter

Washington State Department of Health's bulletin on zoonoses and vector-borne diseases

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Early mosquito sample tests positive for West Nile virus

Although many mosquitoes were late to hatch this year during our cool spring, they are now busily buzzing – and capable of picking up diseases like West Nile virus.

On July 7, a sample of 50 *Culex tarsalis* mosquitoes was trapped near Grandview in Yakima County by the Benton County Mosquito Control District. The District's in-house test revealed West Nile virus, so the sample was sent for confirmatory testing, which also indicated a positive result.

This positive test result is not surprising. West Nile virus has been found in eastern Yakima County in previous years and activity is occurring now in Idaho. What makes this West Nile positive finding concerning is that it was detected so soon this summer.

The earlier West Nile virus is found circulating in mosquitoes and birds in the environment, the longer the season is for people and other animals to be potentially exposed to disease carrying mosquitoes. The key is avoiding mosquito bites.

Tips on staying vigilant against mosquito bites are offered in [Yakima Health District's July 17 news release](#). For the latest activity in Washington go to www.doh.wa.gov/wnv.

Fairs, petting zoos, and preventing disease outbreaks

By Anne Duffy, Public Health Advisor, DOH Zoonotic Disease Program

Each year, more than 70 million people in the United States are stricken with an intestinal, or enteric, disease. Though accountable for a vast majority, foodborne illness is not responsible for all reported outbreaks of enteric disease. Increasing numbers of outbreaks are reportedly attributed to contact with animals in the public setting, such as fairs and petting zoos. Preventable? Yes, through improved education of venue operators, staff, and the general public about animal disease transmission and prevention, in particular, prevention by hand washing.



The article, "[Outbreaks of Enteric Disease Associated with Animal Contact: Not Just a Foodborne Problem Anymore](#)" published in the journal *Clinical Infectious Diseases*, December 2006 provides an insightful review of reported enteric disease outbreaks in the United States during 1991 through 2005.

Fifty-five outbreaks involving 1175 cases were found to be related to fairs, petting zoos, or visitor farms according to the article. Most of these outbreaks were caused by the pathogens, *E. coli* O157 (58%) and *Salmonella* (22%). Other pathogens implicated in these outbreaks include *Cryptosporidium* (4%), *Campylobacter* (3%), *Giardia* (1%), and multiple pathogens (3%). A substantial increase in the number of reported enteric disease outbreaks associated with animals in these venues was observed over the 10-year period, 1996 through 2005. Along with improved surveillance, this increasing trend is likely resulting from a combination of factors involving emerging pathogens, host immunity, or environmental factors allowing for disease transmission.

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"Operation Baghdad Pup" is a project that reunites soldiers and the animals they cared for while stationed in Iraq or Afghanistan.

One of the dogs from a June 5 shipment became ill soon after arriving in the U.S. and tested positive for rabies.

The soldier who cared for the dog that developed rabies reported having the dog for approximately seven months in Iraq and knew of no bites from or exposures to suspect rabid animals.

Rabies imported through "Operation Baghdad Pup"

By Ron Wohrle, Environmental Health Veterinarian, DOH Zoonotic Disease Program

Three dogs, imported from Iraq to Washington State, are currently being quarantined after potentially being exposed to a rabid dog during transport.

On June 5, 24 dogs and 2 cats were imported from Iraq to Newark Liberty Airport, New Jersey, via a commercial airline. The animals were brought to the U.S. through "Operation Baghdad Pup," a project coordinated by the Society for the Prevention of Cruelty to Animals International. Their initiative is transporting animals befriended by our troops in Iraq or Afghanistan back to the U.S. to be reunited with the soldiers or their families at home.

When the dogs and cats first arrived, they were housed in an empty warehouse on airport grounds for approximately five days before being flown to their new homes throughout the country. While the animals were at the airport, they were bathed, groomed, examined by veterinarians, and provided preventive care on June 5 and 6.

One of the imported cats developed neurologic signs and was euthanized within five days of arrival. The cat was ill at the time of transport and had a bite wound of unknown origin on its tail. This cat was tested and documented as negative for rabies by the New Jersey Public Health and Environmental Laboratories (PHEL).

On June 8, the third day the animals were at the warehouse airport, volunteers noticed that one of the dogs was wobbly, showed a change in personality, and had diarrhea. The 11-month-old male Spaniel/Labrador mix was admitted to a local New Jersey veterinary hospital the following day. On admission to the hospital, the dog had a 103.5 °F temperature, a tense abdomen, vocalized strangely, acted confused, and was "snappy." Laboratory testing was negative for parvovirus and distemper virus, and ultrasound, blood counts, and serum chemistries were not remarkable.

The dog gradually became weaker and totally recumbent, and continued to vocalize and show agitation, despite being heavily sedated. He was euthanized on June 11 and tissue specimens were sent to New Jersey PHEL and found positive for rabies by a direct fluorescent antibody assay on June 18. A sample was confirmed positive by CDC on June 20.

An investigation by the New Jersey Department of Health and Senior Services and CDC is ongoing to identify persons and animals that may have been exposed to this dog during its infectious period, from May 29 to June 11. No bite exposures to humans or the other animals in the shipment have been identified, but several individuals, including volunteers, veterinarians, veterinary technicians, and the soldier who had cared for the dog in Iraq, have been identified as potentially exposed to the saliva of the animal and have begun rabies postexposure prophylaxis.

The animals were kept primarily in separate crates, but it cannot be confirmed with certainty that there was no contact between dogs when they were walked or exercised.

On June 23, the New Jersey State Public Health Veterinarian and CDC notified the Zoonotic Disease Program that three dogs included in this shipment were now in Washington State. Through extensive efforts, all three dogs were located in King, Thurston, and Pierce County.

The vaccination and exposure histories for these dogs were unclear. Thus, as a precaution, we recommended that all animals in this shipment be treated as if they had not been adequately vaccinated and were exposed to rabies. And in accordance with state regulations, the dogs should be vaccinated against rabies immediately and quarantined for six months.

The three dogs from this shipment have been re-vaccinated and quarantined/isolated under specific guidelines set forth by each local health jurisdiction. All three dogs remain healthy and will be confined and observed closely for six months.



A wide variety of repellents in various formulations are available to consumers. The Department of Health does not endorse specific brands, but does recommend the use of products containing active ingredients that have been registered with the EPA and evaluated as being effective by the CDC.

Effective repellents approved by CDC update

Repellents are an important tool to assist people in protecting themselves from mosquito-borne diseases. CDC recommends the use of products containing active ingredients which have been registered by the EPA for use as repellents applied to skin and clothing.

CDC evaluation of information contained in peer-reviewed scientific literature and data available from EPA has identified several EPA registered products that provide repellent activity sufficient to help people avoid the bites of disease carrying mosquitoes. Products containing these active ingredients typically provide reasonably long-lasting protection:

- **DEET** (Chemical Name: N,N-diethyl-m-toluamide or N,N-diethyl-3-methylbenzamide)
- **Picaridin** (KBR 3023, Chemical Name: 2-(2-hydroxyethyl)-1-piperidinecarboxylic acid 1-methylpropyl ester)
- **Oil of Lemon Eucalyptus** or **PMD** (Chemical Name: para-Menthane-3,8-diol)the synthesized version of oil of lemon eucalyptus
- **IR3535** (Chemical Name: 3-[N-Butyl-N-acetyl]-aminopropionic acid, ethyl ester)

Read more about CDC's updated information regarding insect repellents at www.cdc.gov/ncidod/dvbid/westnile/RepellentUpdates.htm.

Aerial spraying of mosquito adulticides proves effective at reducing West Nile virus disease

Epidemic transmission of West Nile virus in Sacramento County, California, in 2005 prompted aerial application treatments of pyrethrin, a mosquito adulticide, over a large urban area.

The research, "Efficacy of Aerial Spraying of Mosquito Adulticides in Reducing Incidence of West Nile Virus, California, 2005" published in the May 2008 issue of *Emerging Infectious Diseases*, indicates that adulticiding reduced the number of human West Nile virus cases within the two treated areas compared with an untreated area of Sacramento County. And when data was adjusted for maximum incubation period of the virus from infection to onset of symptoms, no new cases were reported in either of the treated areas after adulticiding, but 18 new cases were reported in the untreated area during this time.

The study found that the odds of infection after spraying were around six times higher in the untreated area than in treated areas, and that the treatments successfully disrupted the West Nile virus transmission cycle.

The California researchers say their results provide direct evidence that aerial mosquito adulticiding is effective in reducing human illness and potential death from West Nile virus infection.



Welcome Caitlin!

Caitlin Reed is the 2008 summer intern for the Zoonotic Disease Program's West Nile virus monitoring project. She is usually found sorting, identifying, and trapping mosquitoes for West Nile virus testing. Caitlin has previously worked with the Columbia Mosquito Control District, and is excited about joining our team, which marks her third summer working with mosquitoes!

Caitlin is a senior at The Evergreen State College, where she is earning her Bachelor of Science degree, and plans to pursue a career in medicine and public health.

Fairs, petting zoos continued from Page 1

Over the past five years, Washington State has experienced its share of incidences and outbreaks of enteric disease related to fairs and petting zoos. A brief snapshot of the larger outbreaks that have been reported during 2003 through 2007 is presented in the following table.

Snapshot of Enteric Disease Outbreaks Associated with Fairs and Petting Zoos in Washington, 2003-2007		
<p>July 2004: Pierce County. An outbreak of cryptosporidiosis involving four children and three adults was linked to a visiting farm. One individual was hospitalized. Individuals had multiple contacts with a sick calf with diarrhea.</p>	<p>August 2005: Whatcom County. Five people, ages 20 months to 23 years old, were stricken with <i>E. coli</i>; all five were hospitalized. Several children or siblings of children spent multiple days at the Whatcom County Fair, caring for and exhibiting animals, and eating in the animal barns.</p>	<p>September 2007: Pierce County. Three children, ages 5 to 14 years old, became ill with salmonellosis after visiting animal barns at the Western Washington State Fair in Puyallup. The pathogen was <i>Salmonella newport</i>, a serotype often associated with livestock, particularly cattle and horses.</p>
<p>June 2005: King County. School camping trip to private farm resulted in 14 students and adults ill with campylobacteriosis. Possible exposures included consumption of unpasteurized dairy products and direct and indirect contact with farm animals.</p> <p>For more, read Public Health Seattle & King County's Epi-Log Newsletter, July 2005.</p>	<p>August 2005: Clark County. An outbreak of <i>E. coli</i> was associated with animal exhibits at the Clark County Fair. Fourteen people, ages 3 to 27 years old, became ill; one was hospitalized. All individuals were exposed to animal exhibits. Several spent multiple days at the fair.</p>	

Popular, especially among young children, fairs and petting zoos provide millions the opportunity to interaction with animals every year in the United States. Pathogens of enteric disease pose the highest risk, with *E. coli* being the most commonly found culprit of disease outbreaks in these venues. Due to exposure and illness to potentially large numbers of people, guidelines designed to decrease the risk of exposure to zoonotic pathogens have been developed.

In a recent study, "[Observation of Practices at Petting Zoos and the Potential Impact on Zoonotic Disease Transmission](#)" in *Clinical Infectious Diseases*, July 2007, 36 petting zoos in Ontario, Canada were evaluated on whether guidelines were properly followed. Observations were recorded on petting zoo practices associated with general guideline themes including education, animal access, hand hygiene, discouraging hand-to-mouth contact, and supervision. The study revealed that current guidelines are frequently not being followed, either intentionally or through lack of understanding. Multiple factors are likely to be involved in these issues, including the lack of education of or understanding by petting zoo operators and event managers, inadequate understanding of zoonotic disease risks by the general public, and economic factors. In conclusion, better education of the petting zoo operators is required to encourage compliance with standard guidelines.

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The Washington State Department of Health refers to the National Association of State Public Health Veterinarians: Animal Contact Compendium as a standard by which to develop guidelines. The compendium provides clear recommendations to reduce risks to enteric disease associated with animal contact in public settings, including fairs and petting zoos. Of these, the recommendation to wash hands is the single most important prevention step for reducing the risk for animal disease transmission. Recommendations cover key practices encompassing education, managing public and animal contact, and animal care and management. Following is a brief summary of these practices:

Education. Education of venue operators, staff, and visitors about the potential risk and measures to prevent infection.

- Post visible signs to refrain from eating in animal contact areas.
- Signs should be age and language appropriate.
- Staff should supervisor animal-visitor interaction.

Managing public and animal contact. Design and management of facilities to control potential transmission events.

- Facilities should have designated animal areas and non-animal areas for activities such as food consumption.
- Hand washing facilities should be clearly identified and able to handle the number of visitors.

Animal care and management. Management of specific animals used for contact with the public to reduce disease risk and injury.

- Animal care - Monitor animals daily for illness, and house them to minimize stress and overcrowding.
- Veterinary care – Provide vaccination, preventive care, and parasite control to animals.
- Rabies - House all animals to reduce potential exposures from wild animal rabies reservoirs, and keep mammals up-to-date on their rabies vaccinations.
- Dangerous animals - Because of strength, unpredictability, venom, or the pathogens that they might carry, prohibit certain domestic, exotic, or wild animals in exhibit settings where a reasonable possibility of animal contact exists.
- Animal births – Ensure that the public has no contact with animal birthing by-products.

Better educated venue operators, staff, and public are required to encourage compliance to guidelines, and to prevent enteric disease outbreaks associated with fairs and petting zoos. This fair season, help improve use of the guidelines, so visitors leave with only the positive benefit of their contact with animals, not the risk.



Photos by Sharon Hopkins