

ZOOONOTIC DISEASE NEWSLETTER

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

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West Nile virus activity continues to swell in Washington

Washington State has seen its most active West Nile virus season to date. By September 28th, 25 people, 64 horses, 19 birds, and 326 mosquito samples have tested positive for the virus. The virus is becoming established on both sides of the state, although the vast majority of positive samples have occurred in and around Yakima and Benton counties. To see the latest activity, visit www.doh.wa.gov/wnv.

Now that we've had over 10 human cases confirmed by the CDC, our state's Public Health Laboratory is now considered certified for West Nile virus confirmatory testing. Not having to send samples to the CDC should speed up the time between when a person's blood is drawn to when they know for certain whether or not they have a West Nile virus infection.

The Department of Health will continue to test mosquitoes through September 30 and will test birds through October 31, unless circumstances indicate a need to extend the testing into November. We will continue collecting data on all horse cases as they get reported by the Department of Agriculture and the Washington Animal Disease Diagnostic Laboratory.

Do bats control mosquitoes?

By Dr. Bobby Corrigan, RMC Pest Management Consulting, Reprinted with permission of PCT Magazine, Copyright 2009

Often times, people are heard to say, "We should not harm bats because they control mosquitoes and other pests." But is this true? Do bats, through their feeding, control mosquitoes, or any pests for that matter? Let's take a closer look at bats and their feeding behavior.

Bats are members of the mammalian order Chiroptera, which means "winged hand." They represent our only true flying mammals. Bats are not flying mice or rats. In fact, they are not even closely related to rodents. With the exception of only a very few species of bats found in the Southwest that feed on nectar, pollen and fruit, the 40 different bat species of the United States feed exclusively on insects. The species that are most commonly found around urban communities, are the "colonial bats," which include the big brown bat, *Eptesicus fuscus*, the little brown bat, *Myotis lucifugus*, and the Mexican free-tailed bat, *Tadarida brasiliensis*. The big brown and little brown bats are our most commonly encountered bats around structures in most states, but the Mexican free-tailed bat is very numerous in Texas and several other southwestern states.



WHAT'S FOR DINNER? Bats may be both opportunistic and selective in their feeding, and several factors are involved as to which specific insects may be consumed in the greatest quantity. In general, research has shown that the little brown bat feeds on soft-bodied insects such as moths, flies, midges, mosquitoes, and mayflies. The larger big brown bat is opportunistic, and preys mostly upon beetles such as ground beetles, "June bugs," cucumber beetles, and other beetles and insects. The Mexican free-tailed bat consumes primarily moths and beetles.

Among the various types of insects consumed by bats, some are of obvious pest significance, such as the flies, mosquitoes, and cucumber beetles mentioned previously. And it is true that a colony of bats can consume thousands, even hundreds of thousands, of insects over several weeks of feeding. But there are several reasons why this cannot necessarily be interpreted as "bats control pest populations."

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James Gathany

Even with a full belly of blood, a mosquito typically isn't the first choice for a hungry bat in most situations. Bats do eat mosquitoes but they shouldn't be relied upon to be the sole source of mosquito control.

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First, insect populations have no trouble compensating for their losses to bats (or to insectivorous birds, or even to our cars smashing them every night along our highways and interstates). The populations of many insect species, especially flies and mosquitoes, are measured in the millions, and commonly in the hundreds of millions. Second, relative to their relationship to people and the ecosystem, bats consume "bad bugs," "good bugs," and "neutral bugs." They are not selective in consuming only those insects that annoy people. Certainly, if a colony of bats consumes several hundred mosquitoes each night in an area, there will be that many less mosquitoes in that area. But does that mean we can sit out on our porches at night without using bug repellent? Don't count on it. There are many other factors at play.

This was clearly borne out to me when I was preparing my master's project on bats. I would stand outside of bat roosts (some containing up to 700 bats) and count the bats as they emerged to feed. The most uncomfortable aspect of that job was how the mosquitoes used to eat me alive while I counted the bats directly over my head. In jest, I used to murmur to the bats as they whizzed by, "Come on! Do your job!" But they had bigger and better goodies to eat over the streams and fields a mile out of town.

Third, we must consider the foraging strategy of the bat. Some people envision bats flying all over their neighborhoods, all night long, capturing and swallowing mosquitoes until dawn. How nice a thought when contemplating plans of sitting out at night during the summer. But the foraging strategy of bats is designed to provide the bats an efficient means of gathering food. Why would a bat spend lots of valuable energy "chasing down" the nutritionally tiny mosquitoes if several larger insects can give it a faster nutritional return?

BATS PREFER "FAST FOOD." For example, research has shown that depending on the local availability of night flying insects, bats usually consume their nightly requirements within the first hour following their emergence from their roosts. In some cases, they feed for short periods, rest temporarily, and then resume feeding again before returning to their roost. Like most mammals, bats have energy budgets to maintain for flight activities, rearing and feeding their young, homeostasis, and fat storage preparation for the winter hibernation. Therefore, bats are usually as efficient as possible to limit their exposure time to predators and to gather more energy and fat than they lose. As an analogy, consider when you eat out. You don't normally waste your valuable energy and time eating your salad, entree, and dessert in three different restaurants.

It is true that if the opportunity presents itself and a bat can collect many small insects in one area quickly and efficiently, it will do so. Many of us have probably witnessed and marveled at bats swooping and diving around a street lamp, consuming large numbers of bugs. In these cases, the bats may fly among the insect swarm capturing the bugs, or even feed with their mouths open — almost as if it were "aerial plankton." In this way they can fill their stomachs quickly. But neither mosquitoes, nor any of the other major urban pest species, comprise the majority of insects at a street lamp.

BENEFICIAL ANIMALS. Do bats contribute with all the other insectivorous animals in providing some type of check and balance of some insect populations (both good and bad bugs)? Yes. And this role is critically important in the overall scheme of our ecosystems. Therefore, bats are biologically useful mammals, and are a very important and unique part of our wildlife. People should protect and even encourage bat populations outside and away from of our buildings. I would even promote pest control associations nationwide to join and support bat conservation groups such as Bat Conservation International to show as an industry we do as we say in our logos: that we protect and guard our environment and provide stewardship of important wildlife.

But relative to pest populations, whether or not the feeding of bats in our urban and agricultural communities provides any measurable benefit (or negative impact via consumption of good insects) is questionable, and certainly begs for more research. At best, their beneficial contributions are likely to vary significantly depending on the very complex local environmental conditions and particular ecosystem. For example, one study of bats around a crop farm did suggest that bats may have had impact on that areas' crop pests. However, because there are so many variables at play, every case is likely to be different. It would not be prudent for farmers or vector control agencies to think of bats as dependable natural pest controllers in either farming or in city communities helping to control diseases.

In graduate school, I fell in love with bats. I am constantly wishing for bats to move into my big, old barn so I can enjoy their company on my farm. But should they do so, I also know that I will still need the insect repellent, and I better constantly monitor the crops and trees for devastating pests.



Fido's and Fluffy's bowls need cleaning too!

By Liz Dykstra, Ph.D., Entomologist, WA Department of Health, Zoonotic Disease Program

You may think of your dogs or cats as family members, but do you handle their food and feeding utensils the same way you handle your own? Practicing good hygiene with pet food and pet food bowls will help keep you and your pet healthy.

While not a lot of information exists on what typically grows in food bowls, Dr. J. Scott Weese of the University of Guelph's Veterinary College in Ontario, Canada said, "It's safe to assume a nice concoction of biofilm and various bacteria, including opportunistic pathogens that live in the mouth are on pet bowls."

Biofilm is that slimy layer that develops in pet bowls and is produced by bacteria to facilitate colonization. Dogs and cats, like people, have bacterial microbes in their mouths and these microbes can be transferred to their food and water dishes.

"There is a multitude of bacteria that are capable of forming biofilms on dog bowls," pointed out Shelley Lankford, a microbiologist and manager of the Public Health Laboratories' Training Program at the state health department. Food left in the dishes can provide the harmful bacteria with a good environment for multiplying (moisture, oxygen, and nutrients) and can cause illness in people who touch the dish and don't properly wash up.

Dirty pet food bowls aren't the only source of harmful bacteria. The past decade has seen multiple reports of *Salmonella* outbreaks traced to contaminated pet food and pet treats. Beef and chicken is often a regular ingredient in dog and cat foods. *Salmonella* bacteria naturally live in the intestines of healthy cows and chickens, so the potential exists for pet foods to become contaminated. *Salmonella* in pet foods and treats potentially can be transferred to people ingesting or handling the contaminated products.

The following incidents of people becoming sick after handling pet food highlight the need for practicing good hygiene.

- Multi-state outbreak of *Salmonella* infections were caused by contaminated dry dog food in 2006-2007. The contaminated dog food was traced back to a single manufacturing plant.
- Contact with *Salmonella*-contaminated pet treats originating from beef and seafood resulted in *Salmonella* infections in Washington and western Canada in 2004-2005.
- Pig ear treats were linked to outbreak of *Salmonella* in Canada in 1999. A follow-up study tested 245 pig ear treats and found an overall *Salmonella* prevalence of 4%.
- Multi-state outbreak of *Salmonella* Typhimurium in 2006 was traced to a company who supplied frozen rodents for pet snakes. Snake owners should be aware of the potential health risks associated with handling rodents, whether still alive or dead.

The type of food you feed your pet is likely to play a large role in what type of pathogens are found in your pet's bowl. Feeding raw food diets to cats and dogs has become increasingly popular. Raw diets however, raise health concerns for people handling the food, people handling feces from animals fed raw diets, people handling food bowls, and animals exposed to animals that are fed raw diets.

People who feed dogs and cats commercial raw food diets should be aware that the products can be contaminated with *Salmonella* and that dogs consuming them have a high probability of shedding the organism. Bacteriological evaluations of 25 commercial raw diets for dogs and cats found *Salmonella* in 20%, *Escherichia coli* in 64%, and *Clostridium perfringens* in 20% of the diets.

Another study found that dogs can shed *Salmonella* in their feces for up to 1.5 weeks after eating a single contaminated meal. Anti-microbial resistance was also detected in some of the *Salmonella* isolates collected from the dog feces. The authors of the study recommended that dogs who are taken to seniors' homes, long-term care hospitals, or other hospital areas for therapeutic visits should not be fed raw diets because of the risks posed by bacterial pathogens and anti-microbial resistant bacteria.



Cyndi Free

Routine cleaning of pet food bowls will help prevent harmful bacteria from growing on them. Washing hands should always be done after handling pet food and bowls.

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Salmonella in pet foods and treats can cause serious infections in dogs and cats, and in people too, especially in high risk populations. "The potential increase in pathogen shedding by animals fed raw meat diets and its effects on high-risk populations are unknown," noted Weese, but he thinks it's reasonable to assume that a health risk may exist for infants, elderly persons, pregnant women, immune compromised individuals, and people treated with antimicrobials. For these individuals, the persistence of *Salmonella* bacteria in food bowls, even at low levels, may be of concern. In such cases, Weese recommends restricting high-risk foods and cleaning pet bowls regularly.

A word of warning – *Salmonella* is extremely difficult to eliminate from pet food bowls. Weese recommends scrubbing the bowl with dish soap followed by a soaking in a 10% bleach solution as the most effective means of cleaning pet bowls.

Whatever you feed your pet, the same good hygiene practices that apply to handling and storing food for people also apply to food and bowls for pets. Good hygiene should be practiced following handling of pet food to avoid cross-contamination of human food and decrease the risk of pathogen transmission. Pet owners can reduce the likelihood of infection from contaminated pet foods and treats by following these safe handling instructions:

Buying Tips for Pet Food

- Purchase products that are in good condition, without signs of damage to the packaging such as dents or tears.

Preparation Tips for Pet Food

- Wash your hands for 20 seconds with hot water and soap before and after handling pet foods and treats.
- Wash pet food bowls, dishes and scooping utensils with soap and hot water after each use.
- Don't use the pet's feeding bowl as a scooping utensil – use a clean, dedicated scoop, spoon or cup instead.
- Dispose of old or spoiled pet food products in a safe manner (such as a securely tied plastic bag in a covered trash can).

Storage Tips for Pet Food

- Refrigerate promptly or discard any unused, left-over wet pet food (such as cans and pouches). Refrigerating foods quickly keeps most harmful bacteria from growing and multiplying. Refrigerators should be set at 40° F. The accuracy of the setting should be checked occasionally with a refrigerator thermometer.
- Dry products should be stored in a cool, dry place-under 80° F.
- If possible, store dry pet food in its original bag inside a clean, dedicated plastic container with a lid, keeping the top of the bag folded closed.
- Keep pets away from food storage and preparation areas.
- Keep pets away from garbage and household trash.
- Keep infants away from food storage, preparation, and feeding areas.

Raw Food Diets

- Keep raw meat and poultry products frozen until ready to use.
- Thaw in refrigerator or microwave.
- Keep raw food diets separate from other foods. Wash working surfaces, utensils (including cutting boards, preparation and feeding bowls), hands, and any other items that touch or contact raw meat, poultry or seafood with hot, soapy water.
- Cover and refrigerate leftovers immediately or discard safely.
- Bowls should be scrubbed with hot, soapy water shortly after feeding to remove food residue and then disinfected.

In Addition

- For added protection, kitchen sanitizers should be used on cutting boards and counter tops periodically. A sanitizing solution can be made by mixing one teaspoon of chlorine bleach to one quart of water.
- If you use plastic or other non-porous cutting boards, run them through the dishwasher after each use.



Opossums and raccoons are opportunistic scavengers who will use their teeth and claws to open garbage and pet food bags. And although they can climb trees, fallen fruit on the ground makes their jobs much easier. Keeping garbage and pet food in sealed storage containers and disposing of fallen fruit helps prevent your yard from becoming a favorite hangout for these animals.



Pests looking for warmth in all the wrong places

By Ben Hamilton, Web and Outreach, WA Department of Health, Office of Environmental Health, Safety, and Toxicology

As cold weather sets in, "critters" often look for warm spots to sleep or build a nest - unfortunately, the cozy spots are often in our homes. The key to keeping unwanted pests from becoming your newest roommates is sealing them out and eliminating enticing food sources.

Pest control companies and animal control workers routinely get calls about mice, rats, opossums, squirrels, bats, and raccoons moving into homes at this time of the year. Attics, crawl spaces, garages, and outbuildings are often easy targets for these creatures.

"These animals can be more than a nuisance if they invade your living area," said Dr. Ron Wohrle, environmental health veterinarian at the state Department of Health. "Rodents, bats, and other wild animals can carry serious diseases. Fleas and ticks, which can ride along on these animals, can also carry diseases that make people sick."

Deer mice, characterized with white bellies and a strip of hair going down the tops of their tails, are common throughout Washington. They can carry a virus which causes hantavirus pulmonary syndrome in people. Hantavirus is a rare, but potentially fatal respiratory disease.

To prevent a hantavirus infection, take precautions when cleaning up rodent droppings. Avoid stirring up and inhaling the dust while cleaning. Wet down the droppings, nests, or other rodent-contaminated areas with a disinfectant or bleach solution - this kills the virus and prevents dust from becoming airborne and being inhaled.

"Mice can get in through the smallest openings," added Dr. Wohrle. "If you can squeeze a pencil through a crack or a hole, a mouse can get in. The goal is to seal up all the small and large openings."

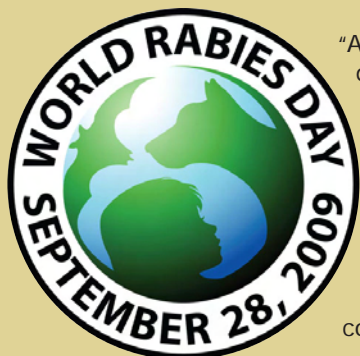
To keep animals outdoors, Dr. Wohrle recommends:

- Put screens over air vents and entrances to crawl spaces under the house.
- Add a screen to the top of the chimney.
- Feed pets indoors and don't leave their food dishes outside.
- Lock pet doors at night.
- Remove trash and food scrapes from inside and outside the home.
- Use steel wool and caulk to fill small holes. Sheet or lath metal, hardware cloth, or concrete can cover larger holes.

If you believe mice or rats have moved in, snap traps baited with peanut butter can be placed in areas where rodent droppings or nests have been found. Poison baits aren't typically recommended. "What often happens is that the animal eats the bait and then goes and dies in an area that you can't reach, which leads to a smelly situation," said Dr. Wohrle. "I've also seen pets who have eaten the poison, which can make them very sick, or worse."

If you're not a do-it-yourself rodent controller, or the infestation is severe, or you're dealing with other types of animals that have moved in, a pest control company or your animal control services should be contacted.

More information on rodent control can be found at www.cdc.gov/rodents/index.htm.



"Although people or pets getting rabies in our state is very uncommon, we cannot let our guard down," said Dr. Ron Wohrle, environmental health veterinarian with the Washington State Department of Health. "Every year, bats across the state test positive for rabies, and any mammal can contract rabies, which is fatal. People should never touch a bat."

"Dog, cat, and ferret owners can commemorate World Rabies Day by making sure their pets are vaccinated," said Dr. Wohrle. "If someone is exposed to a bat or bitten by an animal, they should contact their doctor or local health department."

There are still areas in the world where rabies is a significant problem. Learn what communities around the world are doing about rabies at www.worldrabiesday.org.

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Cryptococcus gattii west coast meeting held in Seattle

By Ron Wohrle, DVM, Environmental Health Veterinarian, WA Department of Health, Zoonotic Disease Program

The second annual West Coast *Cryptococcus gattii* Public Health Working Group meeting was held recently in Seattle, Washington. The meeting was held in conjunction with a CDC Seattle Quarantine Station meeting. The CDC Mycotics Division staff and Washington State Department of Health Zoonotic Disease Program staff co-hosted the gathering which included medical, laboratory, and environmental health professionals from Washington, Oregon, Alaska, California, and Canada.

Cryptococcus gattii is recognized as an emerging environmental fungal pathogen in the Pacific Northwest. *Cryptococcus gattii* began to emerge as a primary pathogen on Vancouver Island, British Columbia in 1999. Most British Columbia *C. gattii* cases were among humans or animals that had contact with a specific region along the east coast of Vancouver Island. By December 2004, the first evidence of disease in humans without exposure to Vancouver Island or other known *C. gattii*-endemic areas was detected. A number of infections in animals and humans with no travel to *C. gattii*-endemic areas have been confirmed on the British Columbia mainland, in Oregon, and Washington.

State updates on *C. gattii* surveillance activities were provided at the meeting, as well as presentations on niche modeling and environmental sampling by experts from the CDC and British Columbia. The working group engaged in lively discussions regarding future surveillance activities involving workgroup members, and the development of a standardized *C. gattii* database readily accessible by workgroup members and others. A database would be valuable for information sharing as reports by various researchers and workgroups are captured. Future funding streams for *C. gattii* monitoring were also discussed. Following adjournment of the formal meeting, the CDC hosted a working dinner in downtown Seattle. Cross-border collaborative surveillance activities, laboratory techniques, and sharing of data and isolates, were among the agenda items.

The West Coast *Cryptococcus gattii* Public Health Working Group was formed in 2008 primarily to connect public health personnel from the west coast states working on obtaining pertinent data on the emergence and spread of *C. gattii*. The group's emphasis is on the public health significance of this emerging pathogen, although research and academic interests are recognized and highly regarded by the working group.

Welcome Wayne Clifford, our new Program Manager

In July of 2009, the Zoonotic Disease Program welcomed Wayne Clifford as its new manager. In addition to Zoonotic Disease, Wayne oversees the Pesticide Illness Monitoring and Prevention Program. Liz Dykstra, our Public Health Entomologist, had been serving as the acting manager.

Wayne comes in with a variety of experience in public health. Wayne began his career at Mason County where he spent seven years working to address water quality issues around shellfish growing areas. With the state, Wayne has served the last 12 years within the Division of Environmental Health. He has provided leadership for recreational shellfish harvesting, served as the manager of the Site Assessments Section (who address public health issues around hazardous waste cleanup sites), and most recently served as the Office Director for Environmental Health Assessments.



As the result of budget impacts to the Division, the Assessments Office joined the Office of Environmental Health and Safety. Wayne moved into the vacant management position for the Zoonotic Disease Program, which merged with the Pesticide Program.

"Change is the only thing that is certain, and I'm excited to help lead the staff in zoonoses and pesticide issues - both of which address high priority public health concerns," says Wayne. "The staff are great people who are dedicated professionals in their fields."

Wayne looks forward to working closely with our partners in public health in these arenas. "I know that addressing state-wide public health issues depends on good teamwork and strong working relationships with our state, local, and other partners. I encourage our partners to engage us in a continuous process of improving our public health products and service delivery."