Pennsylvania Game Commission Wildlife Disease Reference Library

Salmonellosis

<u>Other Names</u>: Paratyphoid, pullorum disease, fowl typhoid

Cause

Salmonellosis is one of the most widely distributed diseases of humans and animals; it is caused by bacteria in the *Salmonella* group. There are more than 2,000 different strains of *Salmonella* that have been found in reptiles, birds, and mammals. Though salmonellosis can infect wild mammals, this disease description will focus on the disease in wild birds.

Significance

Salmonellosis is an important disease of songbirds that congregate at bird feeders. Humans can become ill from this disease, though human infection is rarely linked to contact with infected wild birds themselves. However, people can contract salmonellosis by handling contaminated bird feeders, so people who handle feeders should wear gloves and practice good personal hygiene. Pets and birds of prey are at risk if they prey on infected birds.

Photo by Robin Heagy

Species Affected

All bird species are probably susceptible to salmonellosis, and large-scale mortality events are common at feeding stations. Songbirds, European starlings, blackbirds, common grackles, and mourning doves are most commonly affected. House sparrows, pine siskins, American goldfinches, and common redpolls are particularly susceptible. Salmonellosis has also caused die-offs in ducks, mute swans, gulls, terns, American coots, double-crested cormorants, eared grebes, egrets, and herons, but these species usually experience smaller-scale mortalities than songbirds and colonial nesting birds. Salmonellosis also commonly infects domestic poultry and captive birds. Humans, house cats and birds of prey who are exposed to sick and dying songbirds at feeders can

become infected with salmonellosis. As with many infectious diseases those victims with suppressed immune systems are at greater risk.

Distribution

Salmonellosis occurs worldwide. In wild birds this disease is associated with large concentrations of people and livestock where untreated sewage and manure contaminate the environment. Salmonellosis has even been introduced to wild birds in remote regions such as Antarctica.

Transmission

Salmonella bacteria are shed in the feces of infected animals. The bacteria are transmitted by direct contact with infected birds or by ingestion of food or water contaminated with feces from an infected bird or mammal. Many strains of *Salmonella* bacteria can survive for long periods of time in the environment. The bacteria are known to survive for up to 9 months in soil and in stagnant water. Some species, such as gulls, commonly acquire salmonellosis from human sewage and domestic animal waste. Songbirds often become infected when they congregate at high densities at feeding sites. When captive birds are confined in close quarters, the bacteria can be transmitted via inhalation. In poultry, eggs can become infected with the bacteria, but this mode of transmission is not known to be significant in wild birds.

Clinical Signs

Many factors such as age, stress level, and species of the host bird, as well as strain of the bacteria, influence the severity of clinical illness. Young birds, in general, are more susceptible to salmonellosis. Infection with *Salmonella* bacteria can lead to a variety of disease courses to include sudden onset of, rapidly fatal illness, chronic infections that may or may not have clinical signs, or an asymptomatic carrier state. Non-specific clinical signs of salmonellosis include fluffed or ruffled feathers, lethargy, rapid breathing, shivering, weakness, and eventually coma and death. Neurological signs such as loss of coordination and tremors may be observed. Some birds will also develop diarrhea. Some birds may experience a gradual onset of depression over a few days accompanied by loss of appetite, weight loss, and feathers matted with feces, in addition to the signs mentioned earlier. In these birds, the eyelids often swell and stick together. Sick birds may also exhibit arthritis. Some birds will recover and will continue to shed the bacteria without showing clinical signs.

Yellow, cheese-like nodules in the esophagus of an evening grosbeak caused by salmonellosis. Photo courtesy of USGS by J. Christian Franson

Grossly visible lesions can vary greatly. In some birds necropsy will reveal swollen and crumbly livers with red or pale spots. While in others, small tan to white nodules or plaques may be present on the liver, breast muscle tissue, and other organs. Songbirds often have

yellow, cheese-like nodules on the esophagus, crop, and gizzard. The intestinal lining may be reddened or coated in pale material.

Diagnosis

To diagnose salmonellosis, *Salmonella* bacteria must be isolated from infected tissues.

Treatment

There is no treatment for salmonellosis in wild birds.

Management/Prevention

To prevent large-scale outbreaks of salmonellosis in songbirds, feeders must be kept clean and sanitary. Feeders should be cleaned regularly with a 10% bleach and water solution (9 parts water: 1 part bleach), and feces and discarded seed should be removed from the ground. Feeders should be spaced to prevent crowding. Seed should be stored in insect and rodent proof containers, because rodents are often a source of the bacteria. If an outbreak occurs, bird feeding should be discontinued for a period of 2-3 weeks to prevent further transmission. Outbreaks of salmonellosis in wild birds are also often associated with environmental contamination from human sewage, agricultural waste, and trash dumps. These sources of contamination must be addressed in order to control outbreaks and reduce the number of carrier birds that can further spread the bacteria.

Suggested Reading

Daoust, P., and J. F. Prescott. 2007. Salmonellosis. Pages 270-288 *in* N. J. Thomas, D. B. Hunter, and C. T. Atkinson, editors. Infectious disease of wild birds. Blackwell Publishing, Ames, Iowa, USA.

Friend, M. Salmonellosis. Pages 99-110 *in* M. Friend, and J. C. Franson, technical editors. Field Manual of Wildlife Diseases: Birds. United States Geological Survey.

Michigan Department of Natural Resources. Wildlife Disease. Salmonellosis. < http://www.michigan.gov/dnr/1,1607,7-153-10370_12150_12220-27268--,00.html>.

National Wildlife Health Center. 2011. Salmonellosis. United States Geological Survery. <http://www.nwhc.usgs.gov/disease_information/other_diseases/salmonellosis.jsp>.