



# Veterinary Science Information

## VERY FEW POULTRY DISEASES ARE TRANSMISSIBLE TO MAN

### VSE 06-03

The term “zoonosis” is defined as “an infection or infestation shared in nature by man and lower vertebrate animals.” Even though it is much more likely that we will acquire contagious diseases from our fellow humans rather than from other species, many people are very concerned about zoonotic diseases that they might “catch” due to association with the animal kingdom. Man does share a number of infectious diseases with other mammals. One of these, rabies, is one of the deadliest viral diseases ever discovered. Most, however, are much milder conditions that should be recognized but not feared.

Fortunately, very few infectious diseases of avian species are directly transmissible to man. Most successful disease-causing organisms are highly adapted to particular biological conditions in specific hosts. As avian anatomy and physiology are in many respects quite different from those of mammals, very few avian pathogens can cross the gap and flourish in mammalian hosts to which they are not adapted. Biologically, man has even less in common with other groups such as fish, reptiles, amphibians and invertebrates, so even fewer diseases are shared between these groups. It should be noted, however, that insects do play a very important role in “vectoring” disease organisms between warm-blooded animals. West Nile fever/encephalitis, St. Louis encephalitis and equine encephalitis are viral diseases that may be carried from birds to man by mosquitoes.

Infectious diseases of poultry species that can directly infect humans are chlamydiosis, Newcastle disease, erysipelas, and avian tuberculosis. (In very recent years, certain strains of highly pathogenic avian influenza have directly infected and caused deaths in a few people in Asia and Europe, but this problem has never been documented in North America.) Of these, CHLAMYDIOSIS (also called psittacosis or parrot fever) is the most serious. It is caused by the bacteria *Chlamydia psittaci*. Pet bird species (psittacines) are much more likely to be infected with the organism and pass it on to their owners and handlers than are most other avian species. These comprise the bulk of human exposure cases of chlamydiosis. Wild bird reservoirs of *C. psittaci* include sea gulls, ducks, herons, egrets, and pigeons. Of domestic poultry, turkeys are the most common species known to be productively infected. Very few confirmed chicken cases have ever been cited. Minor species such as ducks, pheasants and pigeons have been reported to have disease problems related to infection with *C. psittaci*.

Clinical signs in turkeys infected by a mild strain of *C. psittaci* may include loss of appetite, loose greenish droppings and mortality rates of 1-4%. More virulent strains cause exacerbation of the above signs with significant weight loss and mortality rates from 10-30%. Egg production of breeders drops rapidly. Post-mortem lesions look similar to those of colibacillosis and include



fibrin and pus coating the heart (pericarditis) and, less frequently, air sacculitis. Enlarged, congested spleens and livers are noted. Chlortetracycline is used to treat diagnosed flocks.

In humans infected with chlamydiosis, flu-like symptoms occur. Signs include fever, chills, headache, weakness and coughing associated with atypical pneumonia. Joint pain, stomach cramps and diarrhea are reported less frequently. The incubation period is 4-15 days, and the mean duration of illness is 9-10 days. The infection may be serious enough to require hospitalization, and deaths have occurred. Tetracycline-class antibiotics are generally used in treatment of human cases.

The most common scenario for human infection from turkeys occurs at the turkey processing plant when workers handling infected turkey carcasses are exposed to aerosolized infectious particles. During the last 50 years in the U.S., several human outbreaks of chlamydiosis have been reported in turkey processing plant workers in Texas, Missouri, Nebraska, Ohio and Minnesota. Most of the infections in these cases occurred in employees in the kill-pick and evisceration departments, but cases also occurred in other areas including further processing. Workers in infected turkey flocks have also been infected.

NEWCASTLE DISEASE VIRUS (NDV) infects chickens, turkeys, and pigeons as well as other types of birds. In commercial poultry in the U.S., only mild strains of NDV are generally present. Cases of Newcastle disease in growing chickens and turkeys result in mild respiratory symptoms and are often followed by secondary *E.coli* infections. ND in breeders or layers can cause mild egg production drops and shell quality problems. Most commercial chickens are vaccinated against ND using attenuated live virus strains which may be followed by killed virus vaccines in breeders or layers.

If people contact live ND virus, including the vaccine strains, in the tissues of the eye, conjunctivitis results. The thin covering of the white of the eyeball and the lining of the eyelids become inflamed, reddened and irritated. The condition generally lasts for 5-10 days and resolves completely. No systemic invasion of the virus into other parts of the body occurs. No treatment other than topical eye drops or ointments to reduce inflammation, discomfort and secondary bacterial infections is generally necessary. The infection is uncomfortable and cosmetically undesirable, but not serious. People most at risk are those handling and administering live NDV vaccines, those doing post-mortem exams on actively infected birds and laboratory workers handling concentrated virus. Wearing gloves and lab goggles, avoiding touching hands to eyes and washing hands after handling virus or vaccine are effective preventive measures.

ERYSIPELAS is a disease condition of poultry caused by the bacteria *Erysipelothrix rhusiopathiae* (ER). Turkeys, pheasants, ducks, geese and rarely chickens are affected. Most species of birds are potentially susceptible. The disease in poultry is most common in middle to late grow-out of market turkeys as well as turkey breeders. Range flocks are more often affected than housed birds. The bacteria are picked up from infected soil and enter the bird through skin scratches and wounds. Flocks that are picking and fighting excessively are more likely to become infected with erysipelas. Artificial insemination procedures used in turkey breeders can also spread the infection. Infected birds often die quickly with unnoticed clinical signs. More chronic cases can show depression and lameness due to arthritis. Signs of general septicemia such as carcass congestion, enlarged livers and spleens and hemorrhages on the heart and other organs are present. Reddened wounds may be present on heads or vents. Penicillin is the drug of choice for treatment, and bacterins have been

used for prevention and control in at-risk flocks. Beak trimming, de-snooding and careful artificial insemination techniques should be practiced. Flocks should be moved from infected ranges.

Large numbers of ER bacteria are present in infected carcasses. People handling these carcasses and performing post-mortem exams on dead birds can get the bacteria into their tissues through small scratches and cuts on unprotected hands and arms. A painful, hot swelling with a dark center called an “erysipeloid” results at the site of infection. It usually remains localized, but in rare instances the bacteria can spread through the bloodstream to other parts of the body causing arthritis and other more serious conditions. Treatment with penicillin or other effective antibiotics should be instituted at once. Localized erysipeloid lesions should resolve completely in a few weeks with treatment. Latex/vinyl disposable gloves should always be worn when posting dead birds. If erysipelas is suspected, double sets of gloves should be worn as added protection.

Avian tuberculosis (T.B.), caused by the bacteria *Mycobacterium avium*, is no longer present in commercial poultry in the U.S. Today, it is seen only sporadically in smaller, “backyard” flocks of chickens greater than two or three years of age. Older ducks, geese, game birds, pet birds and zoological species can also have avian T.B. It is very rare in turkeys. Avian T.B. causes progressive general debilitation with weight loss, decreased egg production and death. Liver, spleen, intestine and bone are target organs of the infection in birds. Granulomatous lesions are seen in these organs. There is no effective treatment for birds. Among mammals, swine, rabbits and mink can succumb to progressive disease and *M. avium* can cause sensitivity in cattle to the tuberculin test. Although humans are considered relatively resistant to infection by the organism, more cases of avian T.B. have been seen in recent years, particularly in immunosuppressed people (people on immunosuppressive drugs or those with acquired immunodeficiencies). Therefore, avian T.B. is considered potentially zoonotic by most medical professionals today. It should be noted, however, that most *M. avium* strains isolated from people are different from the common chicken isolates. *M. avium* is relatively resistant to the commonly used antituberculosis drugs, so effective treatment is difficult to achieve.

Internal parasites (intestinal worms, coccidia, etc.) of poultry are very host specific. Most won't cross over into other avian species let alone into mammals. For example, chicken coccidial species will not infect turkeys and vice versa.

Most external parasites (lice, mites, etc.) are also specifically adapted to avian hosts and will not willingly colonize human hosts for any extended length of time. However, some lice, mites, ticks or bed bugs in infested poultry houses can board humans working in the house. They bite and irritate the skin causing temporary physical (and emotional) discomfort.

The category of food-borne zoonotic disease which includes such bacterial pathogens as *Salmonella spp.*, *Campylobacter spp.*, *E. coli*, etc. is a large topic in itself and will not be addressed in any detail in this article. By definition, it is human disease caused by ingestion of meat or other animal products (eggs, milk) that is contaminated with an offending microorganism or microbial toxin. *Salmonella enteritidis* in poultry meat or eggs is the most commonly cited poultry food-borne human pathogen. Usually, these organisms are NOT causing clinical disease in the animals themselves. However, they may reside in the bird's intestinal tract or contaminate the carcass or product from a completely different source during handling, processing, transport or final preparation. Proper food handling, storing, and preparation are the best defenses against food-borne zoonotic disease.

Some human disease conditions of a non-infectious nature can arise from man's association with poultry. Some individuals develop allergies to bird dander, feathers, bedding materials, etc., that result in typical allergic respiratory symptoms. Ammonia gases in confinement poultry houses are just as irritating to human eyes, noses and throats as they are to the birds. Optimizing ventilation and using litter treatments helps birds and humans alike. Wearing high quality masks or respirators helps decrease people's exposure to dust, dander and irritating gases.

Good hygienic practices should always be followed after handling any animals including birds and their secretions and excrements. Remember, however, that rarely will normal, healthy animals transmit diseases to humans. People should not fear close association with poultry as a significant human health risk.

Prepared by: Patricia A. Dunn, DVM, MAM, DACPV  
Animal Diagnostic Lab  
Penn State University

Where trade names appear, no discrimination is intended, and no endorsement by Penn State Cooperative Extension is implied.

Issued in furtherance of Cooperative Extension work, Acts of Congress May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture and the Pennsylvania Legislature. T R Alter, Director of cooperative Extension, The Pennsylvania State University.

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. The Pennsylvania State University does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 201 Willard Building, University Park, PA 16802-2801; 814-865-4700.