



The Species Specific Educational Resource Team (SSERT)

A Series for Small-Scale Producers and Hobby Owners

Best Biosecurity Practices In Poultry Foreign Animal and Zoonotic Diseases



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Introduction

Zoonotic diseases are diseases that are transmitted from animals to humans. It is important that poultry farmers realize that they can contract certain illnesses from their birds. Although the occurrence of disease transmission from birds to humans is low, the very young, the elderly, and those with compromised immune systems should be cautious. Many of these diseases are transmitted by ingestion of food contaminated by fecal matter. Therefore, the consistent practice of proper animal care, good farmer hygiene and sanitation will minimize the occurrence of transmission of diseases from the animals to humans. Foreign animal diseases are those that are not currently in the U.S.

Zoonotic Diseases:

Campylobacteriosis

Campylobacter bacteria tend to multiply in large numbers in the hindgut of chickens, mainly in the ceca. It is a main cause of enteritis in humans. The infected poultry is a potential reservoir of this zoonosis. *Campylobacter jejuni* infection is not currently considered to be pathogenic in poultry, though a *Campylobacter*-like organism is considered to be the cause of 'vibriotic hepatitis'. *Campylobacte-*

riosis is caused by the ingestion of food contaminated with the campylobacter bacteria.

Diagnosis: Isolation of the organism from cecal contents, cloacal swabs or composite fecal samples. The organism is sensitive to air so swabs should be collected and stored in airtight containers to exclude or minimize airspace. Samples should be tested as soon as possible after collection.

Prevention: Effective sanitation of drinking water, sourcing of water from high quality supplies, avoidance of contact with pets and other species, good hand hygiene by stockmen, and changing of overalls and boots on entering bird areas. Implement a pest management program to prevent insects and rodents in poultry houses. Insects and rodents promote transfer of the *Campylobacter* infection from the general environment into the poultry buildings.

Chlamydiosis

This disease is also called ornithosis when diagnosed in birds other than poultry and in humans. Poultry infected include turkeys, pigeons, and psittacines, but rarely chickens. Some birds (turkeys) are extremely susceptible to chlamydiosis, while others (chickens) are more resistant. Chlamydiosis is primarily transmitted by breathing contaminated fecal dust and is spread by carrier birds, which are the main reservoirs for the disease.

Method to Report Disease: Reporting requirements vary from state to state. Check with the state department of

agriculture for specific state reporting procedures. If a person is suspected of having ornithosis, the county public health office must be notified within 48 hours.

Salmonellosis

Salmonellosis is caused by the ingestion of food contaminated with *Salmonella typhimurium* in poultry meat and *Salmonella enteritidis* in eggs.

Method to Report Disease: In many states, salmonellosis is a reportable zoonotic disease for both health and livestock officials. Contact your local veterinarian.

Colibacillosis

Colibacillosis is caused by *Escherichia coli* infection. *E. coli* is a bacterium which normally inhabits the intestinal tract of all animals. Not all strains are pathogenic. In poultry, *E. coli* infections may cause septicemia, chronic respiratory disease, synovitis (inflammation of the joints which can lead to lameness), pericarditis (inflammation of the sac around the heart), and salpingitis (inflammation of the oviduct). *E. coli* is transmitted through contact with fecal material.

Method to Report Disease: Colibacillosis may be a reportable disease in some states. Contact your local veterinarian.

Arizona Infections (Arizonosis)

Arizona infections are caused by *Salmonella arizona*. *S. arizona* occurs worldwide. It occurs most frequently in reptiles and birds, but all animals are probably susceptible. Outbreaks in turkeys, chickens, and canaries can have up to 60% mortality.

Diagnosis: In most poultry species, *S. arizona* infection results in reduced egg production and hatchability. Poults and chicks show weakness, anorexia, and shivering. In humans, diarrhea is most common. Many infections are subclinical. Septicemia can occur in immunocompromised individuals. Arizonosis is transmitted through contact with fecal material. There is some transmission through eggs. Infected birds can become long-term intestinal carriers.

Prevention: Numerous antibiotics can reduce case fatality, but do not clear intestines of the carrier. *S. arizona* is



Photograph compliments of Beth Tillery, McKee, Kentucky

somewhat less hardy than most salmonella but can survive for months in soil, feed and water.

Method to Report Disease: Arizona infection may be reportable in some states. Contact your local veterinarian.

Eastern Equine Encephalitis

Eastern equine encephalitis (EEE) is caused by a RNA virus in the genus *Alphavirus*, family *Togaviridae*. Outbreaks can occur in commercially raised pheasants, chickens, bobwhite quail, ducks, turkeys, and emus. Abdominal distress and dysentery are the most obvious signs. EEE is mosquito-borne.

Diagnosis: The virus circulates in a mosquito-bird cycle in which passerine birds (i.e., song birds such as swallows, starlings, jays, and finches) are the most common reservoir. The mosquitoes become infected and feed on birds, horses, and humans, further spreading the infection. Most epidemics occur between late August and the first frost.

In adult humans there is a sudden onset of high fever, headache, vomiting, and lethargy, progressing rapidly to neck stiffness, convulsions, delirium, tremors, stupor and coma. In children, EEE is typically manifested by fever, headaches and vomiting for 1-2 days. After an apparent recovery, encephalitis (inflammation of the brain) is characterized by quick onset and great severity follows. Retardation or other permanent neurologic consequences are common in survivors.

Method to Report Disease: EEE may be reportable in some states. Contact your local veterinarian.

Avian Tuberculosis

Avian tuberculosis is caused by *Mycobacterium avium* which is closely related to the human and bovine tuberculosis bacteria. In birds, *M. avium* causes a chronic debilitating disease with tubercular nodules. In humans, *M. avium* infections can cause local wound infections with swelling of regional lymph nodes. The infection is most severe in immunocompromised individuals.

Diagnosis: *M. avium* is spread by ingestion of food or water contaminated by feces from shedder birds. Infected poultry flocks should be depopulated.

Treatment: While most *Mycobacterium* infections are treatable with antibiotics, *M. avium* infection is the exception. *M. avium* is highly resistant to antibiotics. Surgical excision and lymph node removal are often necessary to eliminate infection.

Method to Report Disease: In many states, avian tuberculosis is a reportable zoonotic disease for both health and livestock officials. Contact your local veterinarian. If a person is suspected of having tuberculosis, the county public health office must be notified within 48 hours.

Cryptosporidiosis

Cryptosporidiosis is caused by protozoa of the genus *Cryptosporidium*. There are three known species, *C. baileyi*, *C. meleagridis* and an unnamed species in quail. Cryptosporidiosis normally causes respiratory problems in chickens and turkeys. It can also cause gastroenteritis and diarrhea. In humans, it causes abdominal pain, nausea, and watery diarrhea lasting 3-4 days. In immunocompromised people, it can cause severe, persistent diarrhea with associated malabsorption of nutrients and weight loss.

Method to Report Disease: In many states, cryptosporidiosis is a reportable disease. Contact your local veterinarian. If a person is suspected of having cryptosporidiosis, the county public health office must be notified within 48 hours.

Allergic Alveolitis

Allergic alveolitis, also known as pigeon breeder's lung, budgerigar dander pneumoconiosis, and a variety of other complex names, is one of the most significant avian zoonotic diseases. It may occur as an acute, subacute, or chronic problem.

Clinical signs: are caused by reduced lung capacity due to a hypersensitivity reaction to feathers, dander, or fecal

dust. Inflammation of the pulmonary air exchange units (alveoli) is the inciting lesion. Permanent lung lesions may develop, including pulmonary fibrosis that reduces gaseous exchange and lung capacity.

Treatment: Patients diagnosed with the chronic form of the disease may have no choice except to avoid exposure to birds. Exposure to even minute quantities of feathers, dander, or feces may precipitate a recurrence of severe respiratory distress. The severity of the disease can be reduced by wearing face masks while cleaning cages, cleaning cages daily, bathing pet birds frequently, and installing air purification systems.

Avian Influenza

Avian influenza is also known as fowl plague. It can cause exceptionally high mortality especially in turkeys. In many states, cryptosporidiosis is a reportable disease. Contact your local veterinarian. Symptoms appear with sudden onset. Chickens may die without showing any symptoms. Usually there is weakness and an inclination to stay on the roost. Other signs include loss of appetite, drop in egg production, depression, and coughing, nasal and ocular discharge, swollen face cyanosis of the comb and wattles, and diarrhea.

Diagnosis: A presumptive diagnosis may be made on history and postmortem lesions. Confirmation is by viral isolation in chick embryo. Commercial ELISA test kits are now available. However, as with many such tests occasional false positive reactions can occur. The agar gel precipitation test is non-group-specific and is used to confirm any positives.

Avian Influenza is a potential zoonotic disease. It can result in inapparent infection, conjunctivitis or severe pneumonia. The small number of human deaths associated with HPAI (highly pathogenic avian influenza) appears to have resulted from direct exposure to infected birds on farm or in markets.

Treatment: There is no treatment for poultry, but good husbandry, nutrition and antibiotics may reduce losses. Eradication by slaughter is usually applied in chickens and turkeys.

Prevention: Hygiene, quarantine, all-in/all-out production, etc. Minimize contact with wild birds, controlled marketing of recovered birds. Vaccination is not normally recommended because, although it may reduce losses initially, vaccinated birds may remain carriers if exposed to the infection.

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