

Department of Animal Science

BACKYARD CHICKENS AND *MYCOPLASMA GALLISEPTICUM*

November 2022

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Mycoplasma gallisepticum (MG) was first described in turkeys in the United States in 1905 and is today the most problematic and economically significant of all the poultry mycoplasmal pathogens. MG is a slow-spreading infection that often goes undetected by flock owners, and infected birds may remain healthy without showing symptoms until a stressful event occurs. Immunity level of the flock may be affected by other complicating factors such as environmental factors (heat stress, cold stress, ammonia, dust, etc.), disease challenges (infectious bronchitis, laryngotracheitis, etc.), nutritional challenges or deficiencies, or physiological stressors which can lower immunity level of the flock, causing the MG infection to present itself. MG can easily spread throughout a backyard flock, from house to house on a commercial poultry farm, to neighboring flocks, to birds of different species, and to wild birds. It can be transmitted both vertically and horizontally and can adversely affect fertility, hatchability and chick survival. The disease primarily affects chickens and turkeys but can also infect geese, ducks, gamebirds (bobwhite quail, chukar partridges and pheasants), pigeons, peafowl, Japanese quail and wild birds. MG infection in chickens is commonly known as chronic respiratory disease (CRD). MG is a reportable disease, like avian influenza, infectious laryngotracheitis and other serious poultry diseases.

Numerous mycoplasmas

There are numerous species of mycoplasma, and many of them infect only certain animals; for example, some cause respiratory disease in pigs, some are associated with mastitis in cattle and some result in mild respiratory infections in wild birds. Some are quite host specific; *M. bovis* infects cattle but not hogs, while *M. gallisepticum* can infect a large number of different avian species. Mycoplasmas are very tiny bacteria-like organisms that have less of a cell wall than other bacteria.

MG is found worldwide. The organism has been eradicated from most commercial chicken and turkey breeding flocks in the United States; however, it is still present in other poultry

operations, including many backyard poultry flocks. MG is a respiratory disease that affects the entire respiratory tract, particularly the air sacs, where it tends to localize. Both the upper and lower air sacs may be involved and may initially only appear cloudy but later fill with mucus. In the later stages, this mucus turns a yellow color and develops a cheesy consistency. The heart sac may develop similar symptoms. An infection with MG often resembles numerous other respiratory diseases that affect chickens, such as infectious bronchitis, *Escherichia coli*, and Newcastle disease.

It is not unusual for chickens infected with MG to also be infected with other pathogens, such as *M. synoviae*, *M. melagridis*, *E. coli*, *Ornithobacterium rhinotracheale* (ORT), Newcastle disease and/or infectious bursal disease. When chickens are infected with multiple organisms at the same time, it increases the severity of the symptoms and the difficulty in making an accurate diagnosis. Younger chickens (4 to 8 months of age) and male birds often appear to be more susceptible to severe infections. Like many respiratory infections, the disease is worse in winter months when environmental conditions are often cold and damp, increasing stress levels.

Common signs

MG is the most common upper respiratory infection in backyard chicken flocks. MG alone is often not deadly and may only cause mild clinical signs or lesions in chickens. The characteristic signs of naturally occurring MG infections are watery eyes, tracheal rales, nasal discharge, difficulty breathing, swollen sinuses and coughing. Unfortunately, many other respiratory infections show these same signs, making it difficult to determine the exact cause of the infection without the help of a diagnostic laboratory. Diagnosis can be done by necropsy and culture of sick birds or a blood test to see if MG antibodies are present in the flock. Presence of antibodies means birds have been infected, and even though current issues with MG may not be occurring, infected birds are carriers and may infect other birds, even though they do not appear sick.

Feed consumption is often reduced, resulting in weight loss. In adult laying hens, egg production often declines or may cease in some individual birds. Younger birds may have more severe infections than older birds. MG outbreaks are often quickly followed by many secondary infections that take advantage of the opportunity, which may include Newcastle disease, *E. coli* and infectious bronchitis, particularly when accompanied by high levels of dust or ammonia; these secondary infections cause most of the damage.

Clinical signs can be highly variable and will depend on the host species, age, virulence of the strain, presence of concurrent infections and any environmental or physiological stress (e.g., the onset of egg production). MG is sometimes associated with more severe clinical signs in turkeys than typically seen in chickens. These may begin with nasal discharge and a foamy ocular discharge, followed by swelling of the sinuses. Swelling may become so severe that birds can no longer open their eyes. Coughing and rales generally follow as the disease progresses. Morbidity rate is often high, but mortality is generally low unless complicated by concurrent infections or environmental stress. Commercial broilers and turkeys may suffer high condemnation at processing due to CRD and airsacculitis. Commercial layer flocks may see an overall decrease in egg production.

Transmission

Mycoplasma can be spread in a variety of ways. Hens can spread MG vertically through the egg to their offspring; therefore, some chicks may have it when they hatch. Additionally, MG can be spread horizontally from bird to bird even if they do not appear sick. Birds do not have to be kept together in close contact to catch MG; it can spread from nearby birds. It can also be spread from the droppings and feathers of infected birds and through dust and droplets from nasal secretions in the air. Equipment and tools such as coops, cages, shovels, rakes, egg flats, etc., used around MG-infected birds can spread it to other birds, even after the infected birds are removed. Rodents and other animals as well as wild birds may also carry MG into the area around your birds, infecting them. MG can live for days to weeks depending on the type of material present, longer in chicken manure or eggs, shorter on clean, dry surfaces. Water from unsanitary drinkers may be the most important source of spreading the infection from bird to bird in backyard flock settings.

You may unknowingly be a risk factor to your birds as well. If you have been around other birds that have MG, even if you didn't touch them, you can bring MG back to your birds on your shoes, clothing, skin or hair. MG can live in your nose for up to one day, on straw, cotton, or rubber for two days, and in your hair for up to three days. This is one of the most common methods by which birds get infected with MG. If you have been around other birds besides your own — at a flea market, swap meet, fair, auction, or a friend or neighbor's house, do not visit your birds without first showering and changing clothes.

Be aware that cold temperatures are not an advisable sanitation method. Freezing does not reliably kill MG outside the host bird, but heat, drying and disinfecting do. After depopulating the infected flock, thoroughly clean and dry the infected premises, and then disinfect with bleach or phenolic compounds and leave the premises open and bird free for several weeks before restocking with new birds. Hot, dry weather is more useful than cool damp weather against bacteria.

Treatment and prevention

Preventing MG should be considered the primary goal. This is best achieved by sourcing birds from flocks that are monitored under the National Poultry Improvement Plan (NPIP). Preventing vertical transmission from parent flocks to offspring is a critical first step in the overall reduction of MG in flocks. Most commercial hatcheries are NPIP monitored, and flocks are tested on a regular basis to be mycoplasma free. Backyard flock owners should be advised that sourcing birds from NPIP-participating flocks can help reduce the likelihood of MG outbreaks. Backyard flock owners should avoid purchasing birds with unknown histories (including birds from swap meets, flea markets, online ads, etc.), or, at minimum, quarantine for 30 days and test any new additions to the flock. Educating flock owners on the importance and necessity of biosecurity is essential to not only prevent MG, but also numerous other infectious diseases.

There is no cure for MG, and infected birds remain infected and are carriers of the disease for life. Some antibiotics can reduce symptoms but will not cure or eliminate the disease; therefore, any new birds brought into the flock are at risk of becoming infected. In addition, some antibiotics cannot be used on birds raised for meat and eggs. As a result, treatment in commercial chicken and turkey flocks is usually not beneficial or feasible given meat and egg withdrawal

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times. Depopulation is often the only long-term solution to prevent spread of MG from flock to flock. Should your flock be diagnosed with MG, you should carefully weigh the costs and benefits associated with maintaining any MG-infected flock (which may require continuous antibiotic treatment and is often quite expensive). Humane depopulation of infected flocks, followed by a thorough cleaning and disinfecting of the premises and equipment and starting fresh with a certified-clean MG flock, may prove a better option. In addition, maintaining a strict biosecurity program to keep your flock safe and MG free is a must.

Public health

MG is not zoonotic (able to infect people), and you cannot catch MG by being around MG-infected birds. It is safe to eat eggs from MG-infected flocks if they are cooked and handled properly.

Sources of help

- Your local county Extension agent
- Your local veterinarian
- Tennessee State University Extension Poultry Specialist (615-963-5823)
- University of Tennessee Extension Poultry Specialist (931-486-2129)
- C. E. Kord Animal Health Diagnostic Laboratory (615-837-5125)



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