

# Infectious Bronchitis in Backyard Flocks



Infectious bronchitis (IB) is an acute and highly contagious respiratory disease of chickens throughout the world, so much so that **many consider IB to be the most contagious of all poultry diseases**. It is characterized by respiratory signs that include gasping for breath, coughing, sneezing, tracheal rales (rattled breathing), and nasal discharge. Egg-laying birds, in addition to respiratory signs, often also experience decreased egg production and loss of internal egg quality (watery albumen) and external shell quality (shriveled, wrinkled, or soft-shelled eggs). Today, there are several strains of IB that are nephropathogenic (attack the kidneys) and may cause severe renal damage.

## History

Infectious bronchitis was first described in a flock of young chickens in North Dakota in 1931. Since then, the disease has been identified in broilers, breeders, and laying chickens throughout the world. The occurrence of IB does not maintain a constant level throughout the year; it is **more often a problem during the cooler months of the year**. Vaccines have been available since the 1950s and are commonly used today to prevent major losses.

## Etiology

The organism that causes IB is a coronavirus. Unfortunately, there are a variety of different serotypes (or strains) of the virus, and multiple strains often co-circulate in one geographic area. These numerous strains make control through vaccination more difficult. Three common strains for many years in North America have been Massachusetts, Connecticut, and Arkansas 99. In recent years, Georgia 08 has become a more common strain in some geographic areas.

The IB virus is not a difficult virus to kill. It is fairly fragile and is easily destroyed by disinfectants, sunlight, and heat. However, the **IB virus has the ability to mutate and change its genetic makeup quite readily**, leading to the multiple strains mentioned earlier and, therefore, complicating vaccination programs. Also, because it is a virus, IB can travel on dust particles in the wind, on or in people, and on vehicles and equipment, so even though it is easy to kill, IB seems to get around very quickly.

The body systems affected (respiratory system, kidneys, oviduct, etc.) and severity of the disease will

depend on the strain of the virus, age of the flock, immune status, flock type (broilers, breeders, layers), management factors, and season (i.e., cold stress). Confounding factors such as secondary infections with *Mycoplasma* and/or *E. coli* can exacerbate IB and make the clinical situation worse.

**Chickens are the most significant natural hosts of the IB virus** but likely are not the only hosts. Recent evidence suggests that other species such as geese, ducks, and pigeons may play a role in the spread of IB virus strains around the world (Felippe et al., 2010; De Wit et al., 2011). Unfortunately, we know very little about the role that wild birds may play in the spread of IB. Therefore, the importance of a strong biosecurity program and its role in disease prevention cannot be overstated.

## Clinical Signs

As mentioned earlier, clinical signs often include coughing, sneezing, rattled breathing, watery eyes, and nasal discharge. Most (if not all) birds in the flock will show clinical signs, although mortality may be low unless other complicating secondary factors are present, such as immunosuppression, poor management practices (air quality, temperature control, etc.), *Mycoplasma*, or *E. coli*. Affected chicks may appear depressed and often huddle near a heat source.

In layers, a reduction in egg production of 5–10 percent that may last for 10–14 days is often seen. However, when additional complicating factors are present, production drops of 50 percent or more may be noted. **Eggs produced after the infection may be misshapen, with thin, soft, rough, wrinkled, irregular shells and thin, watery albumen.** A loss of pigment color may be noted in brown-shelled eggs. Given time, egg production and quality may improve somewhat after the initial infection but likely will never return to normal. Strains of IB that affect the kidneys may be accompanied by high mortality as a result of kidney damage. Infection of young chicks may cause permanent oviduct damage, resulting in breeders or layers that never achieve normal egg-production levels.



## Lesions

A mild to moderate inflammation of the upper respiratory tract is often associated with IB. The trachea, sinuses, and nasal passages may contain excess mucus, and, in the early stages, the air sacs may have a clear, foamy, frothy exudate that gradually thickens and becomes cloudy. However, if complicated by *E. coli* or other secondary infections, airsacculitis, perihepatitis (inflammation of the covering of the liver), pericarditis (inflammation of the sac-like tissue surrounding the heart), and increased mortality may be present. For those IB strains that affect the kidneys, kidney damage will likely be severe. The kidneys will be pale and swollen, and urate deposits (white material) may be observed in the kidney tissue and in the ureters.

## Transmission

The IB virus is **easily spread by the respiratory route through coughing and sneezing** of infected birds. The disease spreads very rapidly through a flock once it gets started. **Transmission from farm to farm is also possible and generally results from a breach in biosecurity** related to movement of contaminated people, vehicles, or equipment. There is no evidence that the IB virus is transmitted through the egg.

## Prevention and Control

There is **no cure or treatment for IB**. However, antimicrobial treatment may limit the damage from secondary bacterial infections. Preventing IB from entering your flock should be the ultimate goal, and **prevention is best achieved through an effective biosecurity program**. In addition, in areas where IB is a known problem, chickens should be vaccinated with modified live vaccines to provide protection. However, because there are many different serotypes or strains, vaccination may not always prevent illness. It is important to know which strains are common in your area. Because numerous strains have been identified in the field, it is difficult to know what strains to vaccinate for in a particular location.

Unfortunately, new or variant strains are identified relatively frequently, and these are not fully controlled by vaccines currently on the market. As with many other diseases, biosecurity is your best defense against IB. **It's easier and less costly to prevent disease from occurring than it is to deal with it after it arrives**. As much as possible, maintain a closed flock. If new birds are added or if birds leave the farm and return after being to a show or fair, quarantine these birds for 30 days before putting them back with other flock members.

## Public Health

Humans cannot become infected with infectious bronchitis from their chickens. Bronchitis in humans is caused by a different virus than the IB virus common in chickens.

## Sources of Help

Help is available if you are concerned about infectious bronchitis in your backyard flock or need assistance with disease diagnosis. You may contact any of the following for assistance:

- Your local county Extension agent
- Your local veterinarian
- Mississippi Board of Animal Health (601-359-1170)
- Mississippi Veterinary Research and Diagnostic Laboratory (601-420-4700)
- Mississippi State University Poultry Science Department (662-325-3416); ask for an Extension poultry specialist

## References

- De Wit, J. J., J. K. A. Cook, and H. M. J. F. Van Der Heijden. 2011. Infectious bronchitis virus variants: A review of the history, current situation, and control measures. *Avian Pathology* 40:223–235.
- Felippe, P. A., L. H. Da Silva, M. M. Santos, F. R. Spilki, and C. W. Arns. 2010. Genetic diversity of avian infectious bronchitis virus isolated from domestic chicken flocks and coronaviruses from feral pigeons in Brazil between 2003 and 2009. *Avian Diseases* 54(4):1191–1196.

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Publication 3232 (POD-04-18)

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Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director