

Dynamics of Poultry Diseases – What can be done to prevent diseases?

Thainá Landim de Barros DVM, MS, Ph.D, Assistant Professor and Poultry Health Extension Specialist, Department of Animal Sciences and Center for Food Animal Health, The Ohio State University – landimdebarros.1@osu.edu

Tim McDermott, DVM, Assistant Professor, Extension Educator, Agriculture and Natural Resources, The Ohio State University, Franklin County – mcdermott.15@osu.edu

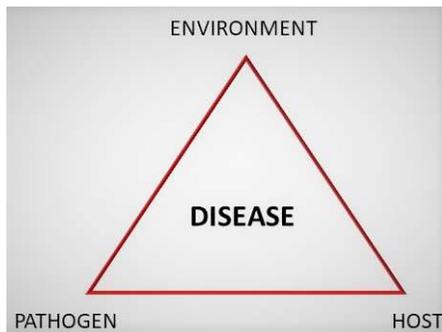


Figure 1. Disease triangle.

Preventing Poultry Diseases

Prevention of diseases is of paramount importance in poultry production. A system perspective, considering bird health, pathogens, barn husbandry, biosecurity, and the role of a veterinarian, is vital to mitigate the risk of diseases. To understand the outcome of the infection with infectious pathogens (viruses, bacteria, protozoa, or fungi), we need to consider multiple factors.

First, it is virtually impossible to eliminate all pathogens in a poultry barn, and consequently, birds' contact with those pathogens.

Second, the infection of a susceptible host in this case, poultry, will depend on the virulence of the pathogen, the dose (the number of microorganisms necessary to cause infection), and the immune status of birds (the ability to fight diseases), in addition to the influence of the environment. The interaction between the host, pathogens,

and the environment is called the disease triangle (Figure 1).

Regarding the entrance of pathogens in the barn and the infectious dose, although we cannot completely eliminate pathogens in a poultry barn, we can limit the entrance of pathogens and reduce the number of pathogens in the house, decreasing the exposure of birds to those pathogens. Some strategies that can be adopted to achieve this approach are:

- Provide appropriate cleaning and disinfection;

- Allow sufficient downtime between flocks;
- Provide water line sanitation;
- Provide feed quality;
- Conduct adequate litter treatment between flocks;
- Practice effective and proactive pest control through the adoption of integrated pest management;
- Wear designated clothes and shoes when in contact with birds;
- Practice appropriate mortality collection and disposal; and
- Avoid contact between domestic and wild birds.

<https://ansci.osu.edu/extension>



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of the publication, visit cfaes.osu.edu/accessibility.

From the birds' health perspective, to guarantee that they will have an adequate immune response avoiding severe clinical manifestation, reduction of performance, measures must be taken not only at the bird level but also at the environment (house) level (Figure 2). That is because the place where birds are raised needs to be considered another living organism that, if not adequately taken care of, will become "sick", representing a potential source of stress for birds and giving an opportunity for pathogens to cause disease.



Figure 2. Understanding the interaction between bird health and environmental management is vital for the success of production.

Some points that must be considered at the environment/barn level are:

- Proper ventilation and air quality:
 - Control the temperature according to the birds' age, stocking density, and outside weather conditions, checking the temperature at the bird level and observing their behavior, ensuring that they are in a thermoneutral zone;
 - Adjust air distribution and speed to deliver fresh air through the barn according to the age of the flock and outside weather conditions; and
 - Measure air quality, including ammonia levels, relative humidity, and dust, and control it to provide comfort to birds and avoid lesions in the respiratory tract, conjunctiva of the eye, and foot lesions of the birds, in addition to

guaranteeing a good work environment for farm employees.

- Management of litter to provide adequate insulation, cushion, and absorbance of humidity:
 - Provide a sufficient amount of bedding material, in addition to the quality of the materials; and
 - Avoid wet litter, with special attention to the height of drinkers and water flow and ventilation; and
- Follow the recommendations of breeding companies for light programs.

Strategies to be adopted at the bird's level:

- Provide an adequate vaccination program (note that the use of many vaccines is not necessarily better – we need to have a targeted approach);
- Acquire day-old birds from a trusted source;

- Use additives and medications with caution;
- Provide water and feed in good quality and quantity;
- Practice proper stocking density, considering the size of the house and the production goals; and
- Observe bird behavior – the best tool for that is a bucket where you can sit and watch birds for 30 minutes.

These are all measures that can assist birds in having immunocompetence to fight infections and adequate welfare. It is also crucial to understand that an exacerbated immune response is not necessarily good; it can be another stress for the birds and can impair performance – it is a delicate balance. In summary, to successfully raise birds, we need to consider the whole system – environment, pathogens, and birds – and if there is a failure in any component of this system, the health, and welfare of the birds

will be compromised and, consequently, to the outcome of the production (meat or eggs).

It is important to establish a close relationship with your veterinarian and have a written veterinary client-patient relationship (VCPR) even before problems in your poultry production system arise. It is most valuable to work with your veterinarian and other industry professionals to identify potential management practices or housing aspects that could be improved to reduce the risk of disease to your flock. The saying “an ounce of prevention is worth a pound of cure” certainly holds true relative to poultry health.

Useful Reference

Collett, S. R.; Smith, J. A.
“Principles of Disease Prevention, Diagnosis, and Control.” In Diseases of Poultry, 14th ed., 3–40.
Wiley-Blackwell