

Biosecurity and Poultry Pathogens

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Three years ago, after the HPAI (Highly Pathogenic Avian Influenza) outbreak affecting more than 20 states and leading to the death or depopulation of 50 million birds, many states and companies started education and awareness campaigns with their poultry grower base. A common question coming from growers at that time, after having explained the wild waterfowl reservoir of the virus, was: "How long will this threat be upon us?" Taking into consideration that this was one of the worst animal epidemics in the history of the country, that there is a wildlife reservoir, and the fact that an outbreak of this disease had not been seen since 1983, this was a fair question.

The exact answer to that question is unknown, but we do know that the viruses are still circulating around the world, including the low pathogenic viruses seen in the US in 2018. Climate change has caused waterfowl to change their normal movement patterns, and paired with multiple hurricanes stirring these birds off path, it is difficult to predict where the virus will hit next. As the virus resides in poultry around the globe and remains in wildlife reservoirs, the looming question is not if, but when and where? As more and more of this virus is found in commercial poultry, it is logical to think that they may recirculate back into wild waterfowl, creating a circle of infection between waterfowl, commercial chickens and commercial turkeys. We have no indication of this threat going away any time soon.

Educating our poultry growers is key to our preparedness and response. Their awareness of the threat is as critical as farm biosecurity and state preparedness. A grower that is aware of the threat not only will be more likely to understand and follow biosecurity, but will be more likely to communicate that to others, and to embrace this new reality as the norm. As the threat persists, biosecurity becomes a way of life and as it

becomes more solid and consistent, we should observe an overall decrease in disease prevalence. The 14 biosecurity principles, put forth by the NPIP (National Poultry Improvement Plan), are simple, logical, sound, and easy to understand. They cover Biosecurity responsibility, Training, Line of Separation, Perimeter Buffer Area, Personnel, Animal and Pest Control, Equipment and Vehicles, Mortality Disposal, Litter and Manure management, Replacement Poultry, Water Supply, Feed and Replacement Litter, Reporting Morbidity and Mortality and Audits. Each company's biosecurity program will be audited once every 2 years starting in 2018.

[The NPIP 14 Biosecurity Principles](#)

In Georgia, as we are presenting our 4th version of an Avian Influenza for Poultry Growers lecture series for the fall of 2019, it is evident that growers have embraced the importance of the Line of Separation and Visitor Control (Training) on their farms, arguably the 2 most important principles of biosecurity to avoid farm contamination. They got it...and that is why we have less disease overall.

As these 14 biosecurity principles have been adopted, we have seen a downward trend in the amount of bacterial and other viral concerns in the commercial setting. Respiratory infections like laryngotracheitis and Mycoplasma, as well as avian influenza and now Newcastle disease, all enter the farm in similar ways. Ensuring the use and implementation of these 14 principles, or a similar biosecurity program, may also help reduce the amount of other enteric bacteria that may be introduced into the house.



Poultry, from any source, tends to have commensal organisms that occur naturally in the gut. This normal microflora can include bacteria that we are all familiar with: *Salmonella*, *Escherichia coli*, *Campylobacter*, *Clostridium*, etc. While these bacteria may be normal for poultry, it is possible for these bacteria to “get out of hand” within the bird’s body. *Salmonella*, especially, has specific serotypes that can be isolated based on geographical location and species. In 2018 alone, there have been multiple cases where FDA, CDC and USDA can link foodborne illnesses and the specific serotype of *Salmonella* to a specific bird species and region of the US. Knowing this information, imagine a scenario (all of the information in the following scenario is extremely hypothetical).

You have broilers located in north Georgia, you give an autogenous vaccine that includes the *Salmonella* serotypes that are historically common for your farm. The vaccine includes *Salmonella* serotypes Kentucky, Infantis, and Oranienburg. Anytime environmental swabs are taken at your chicken house for the NCC program, the lab only ever isolates these 3 *Salmonella* types. After starting the autogenous vaccine, you have noticed the number of positive environmental samples has gone down over the years, but you still occasionally find these 3.

About 2 months ago you had, GlowLights, a Midwest based company, stop by to install new light fixtures in the house. Now each time an environmental sample is taken from that house you begin to find an additional *Salmonella* serotype: Cerro. The numbers of positive samples start to increase

again and there is a rumor that there is a new case of food-borne illnesses caused by *Salmonella* Cerro. “Could it be from my farm?”, you ask yourself. You start your own “mini investigation”. You find out that a large population of broilers in the Midwest traditionally has *Salmonella* Cerro, and that the GlowLights crew had been in a chicken house in Southern Missouri prior to coming to your place. Did this crew bring in the new *Salmonella*? USDA and CDC begins an investigation, to find the source of this *Salmonella* outbreak.

The contamination gets traced back to your farm, and in turn, you discover that one of the crewmembers from GlowLights, Bobby, had not disinfected his shoes prior to coming onto your farm. Bobby’s supervisor says that he was fired due to excessive uncleanliness. Apparently, Bobby never washed the manure off of his shoes! Because of this negligence, you now have an outbreak looming over your head, *Salmonella* Cerro has been re-introduced into the southern US—it’s been absent from this area since the 50’s--and you virtually have a naïve set of birds that are infected with *Salmonella* Cerro. This scenario was a bit excessive but imagine how this may have been different if GlowLights had been directed to follow the 14 Biosecurity Principles and those principles been adhered to. Bobby would have never made it into the house with those nasty shoes. Although the principles were set in place to combat avian influenza and set forth criteria for indemnity payments, proper biosecurity can help with a myriad of viral and bacterial diseases affecting poultry. Following these 14 biosecurity principles to protect poultry farms everywhere is now more critical than it has ever been.

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