

## **Bio-Security: Practical Strategies to Reduce the Risk of Disease in Backyard Flocks**

Maurice Pitesky DVM, MPVM, ACVPM & Martin Smith MS, EdD

The upsurge in popularity of backyard poultry is well documented. Keeping poultry is a relatively straightforward pursuit; however, there are best practices that should be employed to reduce the risk of disease incursion. Unfortunately, as the popularity of raising backyard poultry has increased so has the number of bird owners with little or no education related to *bio-security* – the protection of animals from disease-causing agents. Protecting poultry against disease should be a priority. Determining risks and then developing and implementing an effective biosecurity plan is essential toward that goal. Veterinarians can and should play an integral role in protecting backyard poultry from disease. One strategy to make owners more vigilant about biosecurity is to connect the biosecurity of their flock with public health and food safety.

### **How important is biosecurity at the backyard level?**

A large outbreak of the Foreign Animal Disease, Exotic Newcastle Disease (END) occurred in commercial and backyard flocks in Southern California between 2002-2003. Epidemiological investigations traced the origin of the outbreak to fighting birds. Due to lack of biosecurity END spread throughout Southern California. In order to control the outbreak over 300,000 and 19,000 premises were surveyed and quarantined respectively. Over 4 million birds were depopulated. The federal and state government spent over \$160 million dollars and spent over 10 months to eradicate END from Southern California. One of the lessons learned from the outbreak was the interconnectedness of different poultry populations (i.e. fighting birds, backyard birds, and commercial birds). Due to the ability of diseases like END to be spread between different poultry populations coupled with the presence of zoonotic pathogens like salmonella, practicing good bio-security is beneficial to birds, their owners and society at large.

### **Disease Transmission Risk**

It is important to realize that many biosecurity practices that are common in commercial poultry operations are not practical for backyard poultry. For example practicing “all-in-all out” production (e.g. having poultry introduced and depopulated at the same time and age) is a common commercial management system that reduces the potential for disease introduction and spread. That being said ‘Zero risk’ is not possible. In any situation or environment there is always some level of *disease transmission risk*. However, practical steps can be taken to increase bio-security and reduce the likelihood that one’s birds will contract an illness.

Disease spread occurs commonly as a result of direct, indirect, airborne, fecal-oral, or vector transmission.

*Direct contact* involves physical interaction between an infected animal and a healthy animal. In contrast, *indirect contact* occurs when a pathogen is transmitted to an uninfected animal backyard way of an inanimate (non-living) object. This could be an infected food or watering dish, flooring in a coop, or a nesting box. Furthermore, inanimate objects (e.g., clothing, vehicles, shoes, equipment) can serve to spread pathogens from one location to another. These modes of pathogen transport are commonly referred to as *fomites*. Bacteria such as Salmonella are spread directly and indirectly.

*Airborne transmission* refers to the transport of a disease-causing agent to an uninfected animal via air currents. Specifically, pathogens may be suspended in the air on dust particles or liquid droplets. Transmission of the virus Infectious Laryngotracheitis are primarily airborne.

*Fecal-oral transmission* occurs when pathogens are passed from one animal through its feces and is introduced orally to another animal, typically through feces-contaminated food or water. *Salmonella*, a bacterial pathogen, is transmitted via contact with feces.

*Vectors* are “third parties” that transmit diseases from an infected animal to an uninfected animal. Examples of vectors of poultry diseases include wild birds, rodents, and insects.

*Where does disease transmission occur most frequently?*

To help reduce the risk of disease transmission among backyard poultry, it is important to understand where risks are greatest. *Critical control points* are places or situations where there is a high risk of disease transmission. The goal of *risk assessment* is to identify potential critical control points and implement techniques that will *mitigate* or reduce these risks. Examples of critical control points might be *physical* (e.g., housing; nesting box; food or watering dish) or *biological* (e.g., contact with other animal species, including humans).

### **Bio-Security Risks to Backyard Poultry**

Various studies have revealed an assortment of bio-security risks related to backyard poultry. Among these include: cleanliness of housing; exposure to other animals (e.g., wild waterfowl; rodents; carnivores); non-owner human contact; quarantine procedures; hand-washing precautions; footwear precautions; limited veterinary care; and limited vaccinations. Other, more general bio-security risks include: cleanliness of tools and equipment; adequacy of air flow; freshness of food and water; and cleanliness of bedding.

Organizing these bio-security risks into a practical *risk assessment tool* can help backyard flock owners manage them effectively. A risk assessment tool provides bird owners the opportunity to regularly assess the disease transmission risks their flocks face and find ways to *mitigate* or lower those risks they determine to be high.

### **Backyard Biosecurity: Ways to Keep the “Bad Bugs” Out of the Chicken Coop**

Biosecurity is the most important tool for eradicating and controlling exotic and endemic diseases in poultry populations. This is especially true for backyard birds because they typically do not have access to vaccines and antibiotics. The following is a list of measures veterinarians can go over with their clients

- When obtaining birds isolate them away from other birds for 30 days before adding them into your flock. If your birds were just at a fair isolate the birds for 2 weeks before returning them to your flock. This will reduce the risk of introducing disease into the original flock.
- Keep the coop and surrounding area clean. Wipe down (i.e. dry clean) and clean your coop with a disinfectant periodically and/ or before introducing new birds to reduce the pathogen load. If you use wood to build your coop make sure you paint the wood with a

latex based paint in order to make the wood surface water-proof. Keep harborage to a minimum in order to reduce habitat for rodents and other wildlife that may carry disease. If you have trees near your coop trim the branches so that there is over a 3 foot gap between the branches and the coop (roof rats can jump up to 3 feet). Use 6 inches of gravel around fences to prevent rodents from burrowing under fences.

- Your birds should not have contact with wild birds including game birds and migratory waterfowl, rodents or insects as these may carry disease organisms. Outdoor birds should be kept in a screened in area to minimize exposure to diseases.
- Always obtain birds from reputable disease-free sources that practice good biosecurity methods. Reputable hatcheries should be part of the National Poultry Improvement Program (NPIP) and should use in ovo or day-1 vaccines against Marek's disease.
- Obtain feed from clean dependable suppliers and store the feed in containers that are bird, rodent, and insect proof. Provide clean fresh water to your birds at all times.
- Restrict access to backyard visitors onto the premises where your birds are housed. Allow only people who take care of your birds to come into contact with them. Do not allow people who own other birds to come in contact with your birds. Likewise do not share equipment with other backyard poultry owners.
- Know the warning signs of disease. Watch for increases in morbidity and mortality, sneezing, coughing, watery or green diarrhea, drop in egg production, tremors, altered gait and discoloration of the wattle and comb. If you see any of these warning signs place the sick birds in a quarantine area as far away as possible from the healthy birds.

Biosecurity and food safety are linked. The CDC estimates that 1 out of every 10,000 commercial vv eggs is contaminated with *Salmonella* Enteritidis (SE). Similar studies in backyard poultry are lacking. However, backyard poultry in many cases have a higher risk of contact with rodents, wild birds, cats and dogs which can be carriers of zoonotic pathogens including SE.

Raising backyard poultry can be enjoyable experience. However, reducing bio-security risks are critical to health food, and a healthy flock and surrounding environment. A recommended strategy to accomplish this is to perform regular, systematic bio-security risk assessments of backyard flock, premises, and practices. Using information from a variety of studies and working with experts in the field, the authors developed and tested a risk assessment tool shown in Figure 1. This tool provides individuals who raise animals like livestock or poultry a practical method to help keep the “bad bugs” out of the chicken coop.

Figure 1: Biosecurity risk assessment tool.

Risk Factors	Low Risk	✓	Moderate Risk	✓	High Risk	✓
<b>ANIMAL</b>						
<b>Contact with other species (wild and domesticated)</b>	Never or Seldom		Occasionally		Frequent	
<b>Quarantine procedures for introduction of new animals</b>	Quarantine procedures always used		Quarantine procedures sometimes used		Quarantine procedures never used	
<b>Vaccinations</b>	All recommended vaccinations		Some recommended vaccinations		No recommended vaccinations	
<b>Vaccination Status</b>	All current		Some current		None	
<b>HUMAN</b>						
<b>Non-Owner Human Contact</b>	Never or Seldom		Occasionally		Frequent	
<b>Clothing</b>	Protective clothing; only worn in poultry area; cleaned after each use		Protective clothing; only worn in the poultry area		No specific clothing when working with animals	
<b>Footwear</b>	Footwear only worn in poultry area; disinfected after each use		Footwear worn only in poultry area; cleaned after each use		No specific footwear; footwear not cleaned after each use	
<b>Hand Washing</b>	Always wash hands before and after contact with animals		Occasionally wash hands before or after contact with animals		Rarely wash hands before or after contact with animals	
<b>HOUSING &amp; TOOLS</b>						
<b>Housing (same species)</b>	Animal housed individually		Animal housed in small group		Animal housed in large group	
<b>Bedding</b>	Clean and dry		Soiled and/or damp		Foul and/or wet	
<b>Vermin and Vector Control</b>	No visible signs of vector or vermin		Some visible signs of vector and vermin		Many visible signs of vector and vermin	

<b>Climate (heat, cold, moisture)</b>	Minimal exposure to extremes		Sometimes exposed to extremes		Frequently exposed to extremes	
<b>Air Flow</b>	Adequate ventilation		Some ventilation		No ventilation	
<b>Tools, Equipment, Vehicles</b>	Cleaned & sanitized after each use		Cleaned sometimes		Rarely or never cleaned	
<b>FOOD AND WATER</b>						
<b>Food Quality</b>	Food is clean and fresh		Food is clean; not fresh		Food is moldy, dirty or spoiled	
<b>Water Quality</b>	Clean water; circulated		Clean water; standing		Dirty water	
<b>Food and Water Access</b>	Individual food and water		Shared food and water		Group food and water; many animals	
<b>TRANSPORTATION</b>						
<b>Transportation Frequency</b>	Rarely or never transported		Transported sometimes		Transported frequently	
<b>Transportation with animals</b>	Always transported alone		Only transported with animals from same farm		Transported with animals from different farms	