

# BIOSECURITY PRINCIPLES: *PROTECTING THE UTAH TURKEY INDUSTRY*

*David D. Frame*, DVM, Extension Poultry Specialist  
 USU Turkey Research Center, Ephraim, UT 84627

---

Reviewed June 2010



The events of September 11, 2001 have remarkably changed the nation's perspective in dealing with the safety of our citizens and food supply. Attention has been heightened in protecting our family and businesses from intentional or unintentional harm caused by disease or catastrophic occurrences.

Part of the overall plan of protection for the livestock industry (in this case, turkey growers) is to evaluate and upgrade biosecurity practices. The term "biosecurity" often means different things to different people. For the purpose of this fact sheet, biosecurity refers to *procedures or practices that minimize or prevent flock exposure to disease*.

The recent outbreak of Exotic Newcastle Disease (END) in California, Nevada, Arizona, and Texas serves as a reminder of the ever-present threat to U.S. poultry operations of the devastating effects of foreign animal diseases. Even though the turkey industry in Utah is geographically isolated from other major poultry-producing areas of the U.S., growers should be no less vigilant in protecting Utah flocks from the introduction and spread of economically crippling diseases.

This publication will identify the major biosecurity issues confronting the Utah turkey industry and discuss ways of limiting introduction, spread, and/or occurrence of these threats. It also offers a few suggestions to increase the level of biosecurity on your operation.

## INTRODUCTION OF DISEASE

**Viral diseases of concern.** The main industry-paralyzing viral diseases that threaten turkeys in Utah are:

- 1) Avian influenza (AI), any of the 15 known subtypes.
- 2) Paramyxovirus 1 infection (PMV-1), or Newcastle Disease. (Exotic Newcastle Disease (END) is a severe form of PMV-1 not normally found in the U.S.)

Fortunately, preventive measures are similar for both AI and PMV-1. These viruses are mainly carried by aquatic bird species. A die-off of cormorants in the Midwest in 1992 occurred because of virulent Newcastle Disease, and the mallard duck is a well-documented carrier of AI virus. In the recent END outbreak, backyard game-type chickens were identified as the carrier, with movement of human beings, contaminated equipment and carrier birds responsible for the spread.

**Bacterial diseases of concern.** Fowl cholera is the most economically important bacterial disease of Utah turkeys. It usually affects older birds and may cause considerable mortality and condemnation loss at the processing plant. The causative organism, *Pastuerella multocida*, is spread

by bird-to-bird contact or by rodents and other wild animals. The bacterium usually does not survive long outside a bird or mammalian host.

Another devastating disease, MG or sinusitis, is transmitted from hen to poults through the egg. Infection by MG is prevented by ensuring that breeder flocks are kept free of the causative agent, *Mycoplasma gallisepticum*, and will not be discussed further in this publication.

## **PREVENTION OF DISEASE**

The key to preventing the introduction of AI and PMV-1 viruses into turkey flocks is through total confinement rearing. All feeders and waterers must be kept within bird-proof buildings. This prevents wild birds that live in marshy areas in Central Utah (Yellow-headed Blackbird, Brewer's Blackbird, Red-winged Blackbird and others) from carrying virus from open water and depositing it in feed or water troughs within the turkey pen. Mechanical transmission is a well-known method by which these viruses gain entry into turkey flocks. Never allow turkeys direct access to non-bird-proof areas. Manage building environment, water, and feeder space so that turkeys are never let out of the building.

Prevention through vaccination is of limited value for these diseases. Only killed virus vaccines are readily available for AI, and are very subtype-specific. The particular subtype causing the outbreak must be identified before the appropriate vaccine can be used. Killed virus vaccines must be administered to each individual bird, limiting its economic feasibility for use on a widespread basis.

PMV-1 is endemic to the Sanpete Valley. This means that PMV-1 virus has been circulating around the valley for a long time (at least since the 1970s and probably before). Many flocks raised out of doors will become naturally infected and show no adverse problems. Only judicious and limited use of commercially available live PMV-1 virus vaccines is recommended. The introduction of END (the highly pathogenic "exotic" form of PMV-1 virus) is prevented by not allowing farm workers to keep chickens and game birds at home, and by making sure turkeys are enclosed and never exposed to wandering nearby flocks of game chickens or barnyard fowl.

Fowl cholera is minimized by following these principles:

- 1) Prevent direct contact of potential disease carriers, such as mice and squirrels, with turkeys.
- 2) Control the turkey's environment so that day/night temperature fluctuations never exceed 10-15° F.
- 3) Vaccination is useful for control in some circumstances. It must be remembered though that the modified live vaccines commonly available have the potential of causing or exacerbating the disease in flocks that are already immunocompromised or are under environmental stress, such as dustiness or extreme temperature fluctuations.

## **DISEASE SPREAD**

**Production practices.** A fact of life on a turkey farm is that things must come and go. Shavings need to be brought in, poults and feed must be delivered, and turkeys have to be removed for processing. The grower must identify and control critical points such as traffic patterns and personnel movement in order to minimize the chance of disease introduction onto the farm. Utah State University Extension provides a *Biosecurity Evaluation Worksheet* that aids the grower in recognizing and rectifying on-farm biosecurity issues. (Contact the USU Extension Poultry Specialist for more information about this service.)

**Environmental factors.** Turkey growers have limited ability to control some of the environmental components of turkey growing, such as prevailing wind and geography. However, it is important to recognize them because some of these environmental factors may be minimized or even used to the grower's advantage.

- Prevailing wind: Certain diseases may be transported through the air. A grower that has a turkey operation upwind may have an advantage in keeping infection-free during an outbreak of air-disseminated disease.
- Open bodies of water: Waterfowl are attracted to open water. As mentioned earlier, ducks (particularly the mallard) are notorious carriers of AI virus. The AI virus is shed in the feces and may remain viable for a long time in cool water. Never use open water sources to mist or cool turkeys, and certainly not as drinking water!
- Seasonal and diurnal temperature fluctuations increase the risk of fowl cholera in turkeys. The remedy is to house turkeys year round in total confinement operated under adequate environment control (fans, heaters, and computerized controllers).

**Social interaction.** Gathering together is human nature. Healthy interaction with other turkey growers fosters learning and camaraderie. Just remember to leave your farm clothes and trucks at home. Here is a common-sense rule of thumb: ***Change into clean clothes before visiting other growers, and change clothes again before returning to your own farm flock. Travel to social events in freshly laundered clothing and in an off-farm vehicle.***

## **ON-FARM PROTECTION**

**Logbook.** Provide a logbook at the farm entrance for visitors to sign as they enter and leave the premises. Logbooks may also be useful in individual buildings to monitor worker activity. Logbooks provide a record of human activity in case of trouble or disease outbreak, and signing in and out reminds visitors and employees that biosecurity practices are taken seriously on this farm.

**Equipment use.** Human traffic is not the only way disease is spread from farm to farm. More commonly, contaminated trucks, trailers, and tractors are the culprits. Consider these guidelines:

- Regionalize equipment to specific areas of the farm, such as to one brooder, one growout building, or one farm area.
- Limit equipment to a specific use. For example, a front-end loader may be dedicated to litter removal, but never used for hauling fresh shavings; or one feed truck may be used to deliver feed only to a specific sector of the farm.
- If equipment must be shared around the farm or used for various purposes, rigorously clean and disinfect between uses. It is critical to remember that all organic matter and dirt must be thoroughly removed from equipment before disinfectants will work. It doesn't matter how much disinfectant is used, if the surface is not clean, you're wasting your money on the disinfectant. *Clean* is the most important part of the phrase, "clean and disinfect."

- Do not lend to or borrow equipment from other growers.

**Traffic control.** On-farm traffic consists of:

- 1) Employees and other personnel and their movement while at work
- 2) Daily activity of equipment and feed trucks
- 3) Processing plant inspectors, processing trucks, trailers, and catch crews
- 4) Public utility personnel such as meter readers, UPS delivery persons
- 5) Visits from relatives and family friends
- 6) Pets
- 7) Other visitors

Consider these suggestions:

- Designate specific parking areas away from turkey buildings for employee vehicles, visitors, and regionalized equipment storage.

- Where appropriate, install gates to control vehicle traffic.

- Use foot wash stations and disinfectant footbaths at each entrance of every turkey building.

Remember to use the foot wash and thoroughly remove dirt before stepping through the disinfectant footbath. Keep the disinfectant in the footbath clean and fresh by changing the solution at least once daily (more frequently if it becomes contaminated with dirt and organic debris).

- Alternatively, provide clean disposable footwear at the building entrance. This may be a better option during colder times of the year.

- Maintain separate clean coveralls at every building entrance. Put on coveralls while inside with the turkeys and take off again as you leave that building.

- Provide disposable footwear for all casual visitors, such as meter readers and salesmen.

Require that they sign the logbook, and give clear instructions on where they may and may not go.

- Construct outside feed bins so that no vehicle hauling feed ever has to directly enter a turkey building. Gravel or paved driveways accessing these bins will help reduce contamination caused by dirty truck tires.

- Design on-farm traffic pattern so it minimizes cross traffic on common roadways.

- Post restricted entry signs near entrances of main roads and turkey buildings.

- Never allow pets to enter turkey buildings.

- Keep turkey buildings and implement sheds locked to control access and discourage theft.

- Lock and clearly label all medications and chemicals.

- Take charge of what comes on to your property. If a feed truck or live haul trailer arrives that is obviously dirty, demand that it not enter until it meets your on-farm biosecurity standards.

Ultimately, you are the last line of defense between outside contamination and your turkeys.

**Insect, rodent, and wild bird control.** Achieving efficacious protection from potential disease-carriers such as rodents, other wild mammals, wild birds, and insects is multifaceted; however, it all starts with raising turkeys in total confinement. It is impossible to adequately protect turkeys from such exposure without raising them indoors behind sturdy barriers where environmental conditions can be optimized.

Fly control in agricultural areas is becoming an increasingly important component of Good Management Practices because of encroaching residential building. Stack used litter well away from buildings and keep the piles dry. Regularly remove mortality in turkey flocks to reduce fly breeding substrate. The use of pheromone-containing fly bait around buildings is useful for knocking down the adult fly population.

Control mosquitoes by eliminating areas of standing water where they are able to breed. Mosquitoes lay eggs in rafts of 150-300, typically in standing water often containing organic matter. Remove old tires, unused parts of equipment, and other junk where small pools of water may form. Pick up and discard soda cans and plastic jugs. Landscape or modify grade to eliminate areas where rainwater may pool. It takes surprisingly little standing water to produce a sizeable mosquito population. On-farm mosquito control is important but often overlooked. Mosquitoes have been shown to be carriers of various poultry diseases as well as West Nile Virus (a potential disease threat mainly to horses and human beings).

Using mechanical traps or offering baits may control the mouse population. Keep perimeter of buildings weed and trash free for at least 5 feet away from outside wall. This removes harborage and discourages rodent migration into the area. The removal of standing water will also reduce the

likelihood of rat infestations. Consult the USU Extension Pesticide Specialist for specific control methods.

## SUMMARY

Implementing protective biosecurity measures is critical in turkey production. Most infectious diseases of significant economic importance are brought into Utah by outside sources, such as migratory birds, and introduced into the turkey population by mechanical means – either man, wild animals, or equipment. Even though geographically isolated, Utah turkey growers face unique biosecurity challenges that must be recognized and dealt with in realistic and appropriate ways.

Building a workable biosecurity program requires:

- Becoming acquainted with how disease is introduced and spread
- Identifying the risks
- Modifying traffic patterns, human behavior, equipment use, and management practices to minimize those risks
- Implementing the appropriate procedures
- Enforcing those procedures
- Periodic re-evaluation of the biosecurity program and modifying as needed

Utah State University is committed to providing an environment free from harassment and other forms of illegal discrimination based on race, color, religion, sex, national origin, age (40 and older), disability, and veteran's status. USU's policy also prohibits discrimination on the basis of sexual orientation in employment and academic related practices and decisions.

Utah State University employees and students cannot, because of race, color, religion, sex, national origin, age, disability, or veteran's status, refuse to hire; discharge; promote; demote; terminate; discriminate in compensation; or discriminate regarding terms, privileges, or conditions of employment, against any person otherwise qualified. Employees and students also cannot discriminate in the classroom, residence halls, or in on/off campus, USU-sponsored events and activities.

This publication is issued in furtherance of Cooperative Extension work. Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Noelle E. Cockett, Vice President for Extension and Agriculture, Utah State University. (AG/Poultry Health/Biosecurity/03)