

CHAPTER 7

Health Promotion and Biosecurity

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In recent years Avian Influenza and other infectious diseases, like Exotic Newcastle Disease, have threatened flocks and made the trade and transportation of birds difficult for some producers. Poultry raisers can protect their valuable flocks proactively by promoting flock health and establishing biosecurity procedures for their property. As each farm is different, one plan of action may not work for all. The following text will cover concepts that will aid in developing a plan that will work best for an individual farm and aid in avoiding easily preventable health problems before they occur in the flock.

Health Promotion¹

The most important thing to be done for disease prevention and flock health is to start with – and add – only disease-free birds into an environment conducive to bird health. Watch your flock closely so you can catch any illness early. Signs of ill health may include: a change in behavior, watery eyes, nasal discharge, swelling around eyes, abnormal odor, runny or off-colored manure, lack of normal activity, slowness of movement, walking backwards, shivering or “haunchiness”, irregular shape or color of iris, unusual paleness of face, comb/snood, and wattles, and loss of appetite and weight. Identifying illness early on will help avoid the spread of disease or the potential loss of stock.

Providing an environment conducive to the health of poultry will help a producer avoid many common illnesses. Dust and ammonia from old manure can damage the health of lungs, making poultry prone to

Ammonia levels and their affect on birds	
PPM = Parts/Million	
10 PPM	damage occurs in air sacs over several weeks
25 PPM	damage occurs to air sacs and lungs in 48 hours
50 PPM	humans can begin to smell ammonia, significant damage to air sacs and lungs in 1-2 weeks
100 PPM	some mortality in birds will begin to occur

infection. The rule of thumb is if the smell of the poultry area is offensive or it burns eyes, or the dust makes people sneeze, then it is past time to clean the facilities. To give an idea of how vulnerable the birds are from ammonia, consider the chart below.

- Encourage healthy levels of activity in the birds.** Exercise is important for muscle tone, good circulation, and health, particularly in active breeds. Providing poultry room to move around and an environment tailored to their needs (i.e. roosts, nest boxes, or pools, etc.), will greatly increase their level of activity and make them more physically fit overall.
- Provide clean, fresh water daily for optimum health.** Thoroughly clean the containers weekly or more often if necessary. Allowing a film to form on the water container discourages drinking and exposes your poultry to small doses of toxins released from this algae-like material. While this rarely noticeably affects healthy stock, individuals whose immune systems are already challenged may be at greater risk of becoming ill. Poults who drink from water containers with slime buildup, and which have infrequent water changes, show a greater mortality from coccidiosis.
- Provide adequate quality feed for the flock.** Proper nutrition will support the health of poultry and help stave off diseases. A bird that has been poorly fed is under stress and will be more prone to infection. Feed should be fresh, free of molds or fungi, unspoiled, and in sufficient quantities to satisfy the needs of poultry.
- Build the health of poultry by feeding them more than just the necessities.** Vitamin-mineral supplements, probiotics², greens such as kale, and even yogurt can be used to build the health of your poultry.
- Don't overlook grit as a component of your feeding regime.³** Grit helps the birds to grind food materials in the gizzard and allows birds to digest a higher percentage of the nutrition in the food. Grit also decreases the chances of impaction of the crop and is associated with the reduction of illnesses such as Necrotic Enteritis.

Producers assume that pastured birds get all of the grit they need as they forage. Some soil types do provide grit of appropriate size and quantity, but this is rarely the case. Oyster shell and limestone are excellent sources of calcium, but they are too soft to serve as a replacement for grit. Granite grit is often the best solution. The following is a rough guideline of grit size for turkeys:

Bird Size	Grit Size
Poult 4 to 8 weeks of age	3/32 – 3/16 inches
Poult 8 to 12 weeks of age	3/16 – 5/16 inches
Turkey 12+ weeks of age	5/16 – 7/16 inches

According to *Turkey Management* by Marsden and Martin⁴ “There is no evidence to show that turkeys on finely ground all-mash diets need grit. Where whole or cracked grain or fibrous green feed is fed, however, the need for insoluble grit is well established. Any grit that is easily broken up into small pieces is too friable to be valuable as grit and also is likely to be over-consumed. Experience has shown that when turkeys have access to gravelly soil there is nothing to be gained by supplying them with additional insoluble grit such as is sold commercially. Grit consumption by confined turkeys should be watched closely and if excessive, should be cut down to desirable proportions by removing the grit for several days or by hand feeding, sprinkling a sufficient amount on top of the mash.”

• **Take preventative measures to reduce parasite infestations.** Common parasites, like lice, mites, and worms should be treated before they affect the health of poultry. Parasites not only make poultry uncomfortable, but they also decrease their health by robbing them of blood nutrients, leading to anemia, malnutrition, and even death. Keeping facilities clean and avoiding overcrowding of the birds are effective tools for parasite management. Providing the birds with a place to dust bathe reduces external parasites. Adding diatomaceous earth, tobacco dust, or five percent Sevin dust to this area enhances the effectiveness of dust bathing.

• **Reduce stress.** Stress opens the doors to disease. While it is true that exposure to unclean environments can help develop an immune system, this can weaken the immune system at the same time. Poor and inadequate feed, lack of fresh water, and limited exercise are also stressors. An already challenged immune system is less effective at warding off disease. This is why it is advisable to enhance your husbandry practices especially during times of disease outbreaks and potential

exposure.

• **Vaccinate birds to help prevent disease.** Vaccination can be an excellent tool for protecting the flock. However, vaccination should be used only when birds are at risk for a certain or specific disease. Vaccines cause the development of antibodies, which can protect the flock from disease. The American Poultry Association has developed a useful table of diseases controlled by vaccines (see resource section). Caution should be taken with the use of live vaccines in flocks located within areas where the disease is not prevalent. The use of live vaccines can potentially cause an outbreak of disease in nearby flocks or to newly acquired poultry that have not been vaccinated for the particular disease.

When it comes to flock health, it’s all a matter of getting back to the basics. Your efforts will pay off if you concentrate on being proactive instead of reacting after a problem has occurred. The old adage still rings true today, “An ounce of prevention is worth a pound of cure.”

Keeping livestock and poultry healthy is the keystone to any livestock or poultry agricultural endeavor. Healthy animals grow better, reproduce more efficiently, and produce more economically valuable products. Unhealthy animals cause a producer to spend more time managing the stock and more money on health inputs and vet bills. They often produce less or poor quality products. Without healthy animals, conservation, production, and profitability are impossible.

One of the reasons rare breeds of livestock and poultry are so appreciated by their keepers is because they are so naturally hardy. This hardiness comes from practical selection within the environment of the small farm where expense decisions have historically been carefully weighed. Judicious practices such as culling unthrifty individuals, when practiced over many generations, leave most of the historic breeds on ALBC’s Conservation Priority List with very hardy immune systems. This hardiness, however, does not make these breeds immune to all potential health threats.

To maintain the health and hardiness of rare breeds, there are a number of “tools” available: careful and well-thought out breeding strategies, selective culling, appropriate nutrition plans, modern medicine, passive transfer of antibodies, and reducing potential exposure to disease. All of these and more represent the scope of

Avian Influenza Considerations

Avian influenza is a disease of particular concern. Some pertinent facts about this disease help to explain management practices that aid in the prevention of such diseases.

- “High path” avian influenza causes high mortality and can be characterized by rapid losses of a large percentage of poultry very quickly.
- Incubation period from exposure to high path avian influenza is from three to seven days. For particularly virulent strains, death from infection takes as little as two to five days after exposure.
- Wild waterfowl are considered reservoirs of this disease. Avoid mixing species as mixed-species flocks can act as catalysts for virus mutation and increase the risks of outbreaks.
- During the 1983–1984 outbreak in Pennsylvania, only waterfowl and shore birds, such as ducks, geese and gulls, showed serological evidence of infection with avian influenza. Sparrows, starlings, pigeons and crows showed no evidence of infection.
- A healthy pigeon or other domestic or wild bird can land among an infected flock and mechanically carry virus on their feathers to a healthy flock.
- Italian researchers have found that infected turkeys shed 10,000 times more avian influenza virus in their feces than infected chickens.
- The infectious agent is primarily excreted through feces and is not significantly transmitted by aerosol, except in the case of transfer of virus between birds in a single house.
- Avian influenza virus survives longest at cooler temperatures. For example, the virus survives for 35 days at 39.2° F and seven days at 68° F.
- Avian influenza virus is easily destroyed by detergent, disinfectants, sunlight, drying, and heat. The FAO Animal Health Special Report states: “The avian influenza virus is more simple to destroy than many other viruses since it is very sensitive to detergents which destroy the fat-containing outer layer of the virus. This layer is needed to enter cells of animals and destroying it therefore destroys the infectivity. The virus survives well in water, and simple washing may assist the virus to enter into areas where it is picked up by other birds. Therefore any washing to remove contamination should always be with detergents (soapy water) or specific disinfectants.”
- Flocks confirmed to have AI should be depopulated.

biosecurity. Reducing potential exposure to disease is particularly important during times of disease threat and is an element easily controlled by you, the steward, for very little expense.

The threat of contagious disease can be reduced or prevented by removing the possibility of contact between the disease and the animal. This is done by addressing the many ways disease could be introduced. Controlling disease transmission vectors is particularly important when a highly infectious disease is circulating. Given that today distance is much less a limiting factor, all livestock keepers should implement such individual biosecurity protocols that will work well for their own situation.

Creating a Contagious Disease Biosecurity Plan

A Contagious Disease Biosecurity Plan is useful in preventing disease, and in validating and documenting your commitment to disease prevention. During times of disease outbreak, having a Contagious Disease Biosecurity Plan and evidence of its implementation may be the difference between retention or pre-emptive destruction of your stock due to disease eradication efforts.

The American Livestock Breeds Conservancy has compiled a list of biosecurity protocols that can be used to tailor a Contagious Disease Biosecurity Plan for your individual farm. We have provided a sample plan that can be adopted as is, or that can be reviewed as a basis in understanding how to formulate a custom plan. The ALBC Contagious Disease Biosecurity Plan is complete with protocols to implement during routine or

crisis situations – you simply check off those protocols that will work on your farm. Choosing protocols can be easy, but it is important that you follow all of those protocols you select. So, use the following Contagious Disease Biosecurity Plan as an outline to help you understand the principles of biosecurity and to help you formulate a plan that will fit the particular needs of your farm. What you do today will protect you and your livestock well into the future.

The following worksheets are guidelines from which producers can generate a customized biosecurity plan

for their farms. Every farm is unique and not all of the suggested measures can be practically taken in every instance. Review the proposed actions in each category and choose those that would work best to create a plan. The plan can then be posted in sight of all workers or visitors to the farm. The creation and implementation of a farm biosecurity plan is an important demonstration of how the producer is making a conscientious effort to reduce or eliminate risks associated with contagious disease on his or her farm.

HOW TO RAISE HERITAGE TURKEYS ON PASTURE



Farm Name and Address

Disease Considerations

Infectious disease may be transmitted when aerosolized, such as by a sneeze or cough, through infected feces and urine, through close contact with infected animals, through use of common feeders and waterers, by handling of sick and then healthy animals or birds, through contact with transmission vectors such as wild birds, rodents, and insects, and through contact with contaminated boots, clothing, vehicles and other equipment. Prevention, observation, and quick control are your best tools.

Prevention

Keep your livestock and poultry healthy by providing fresh feed, fresh clean water, and plenty of ventilation and sunshine. Additional tactics will limit their exposure to disease.

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Wear dedicated clothing and footwear only while tending your poultry/livestock. Do not wear dedicated clothing or footwear off property.
<input type="checkbox"/>	<input type="checkbox"/>	Clean boots and disinfect at the beginning and end of each visit to your poultry/livestock area.
<input type="checkbox"/>	<input type="checkbox"/>	Do not share feed delivery with trucks traveling from other farms.
<input type="checkbox"/>	<input type="checkbox"/>	Store feed in clean, dry place free of rodents and wild birds – open feed bags should be placed in clean, covered containers.
<input type="checkbox"/>	<input type="checkbox"/>	Control rodents, wild birds, and other animal and insect vectors.
<input type="checkbox"/>	<input type="checkbox"/>	To reduce the likelihood of cross-species disease transmission, separate species; e.g. separate waterfowl from landfowl and swine from poultry in the face of an avian influenza outbreak.
<input type="checkbox"/>	<input type="checkbox"/>	Tend young, healthy stock first, followed by mature, healthy stock, quarantined stock. Tend sick stock last to prevent disease transmission.
<input type="checkbox"/>	<input type="checkbox"/>	Clean water and feed troughs daily.
<input type="checkbox"/>	<input type="checkbox"/>	Know the source of water for your stock. Diseases such as avian influenza can be transmitted via water contaminated by wild birds or other animals.
<input type="checkbox"/>	<input type="checkbox"/>	Regularly clean and disinfect buildings, pens, and equipment.
<input type="checkbox"/>	<input type="checkbox"/>	Locate compost pile for used bedding away from stock, people, and vehicle traffic.
<input type="checkbox"/>	<input type="checkbox"/>	Allow clean pens to remain empty for 24 hours or longer.
<input type="checkbox"/>	<input type="checkbox"/>	Clean and disinfect all shovels, brooms, and dust pans after use.
<input type="checkbox"/>	<input type="checkbox"/>	Develop a relationship with a veterinarian while animals are healthy.
<input type="checkbox"/>	<input type="checkbox"/>	Develop and write out your own biosecurity plan. This may be the difference between saving or pre-emptive destruction of your stock in the event of a disease outbreak.

Observation and Detection of Unhealthy Animals or Birds

Use early detection and treatment to halt the spread of diseases.

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Isolate any sick animals from healthy animals.
<input type="checkbox"/>	<input type="checkbox"/>	Cull weak and sick individuals quickly.
<input type="checkbox"/>	<input type="checkbox"/>	Promptly remove and properly dispose of any dead animals.
<input type="checkbox"/>	<input type="checkbox"/>	Seek help from a veterinarian or experienced stock keeper when more than one animal becomes sick.
<input type="checkbox"/>	<input type="checkbox"/>	Perform a post-mortem examination to determine any disease present. The Department of Agriculture for most states provides this service at little or no cost.
<input type="checkbox"/>	<input type="checkbox"/>	Report outbreaks of sick poultry/livestock to your state Department of Agriculture.
<input type="checkbox"/>	<input type="checkbox"/>	If practical, confine poultry/livestock indoors during times of outbreak risk.

Disease Transmission Check List

The transmission of disease may be prevented through good management practices that address the vectors of disease transmission.

People as Transmission Vectors

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Control access to poultry/livestock.
<input type="checkbox"/>	<input type="checkbox"/>	If allowing visitors, provide or require that they wear clean protective clothes and footwear. Use footbath or plastic boot covers for visitors.
<input type="checkbox"/>	<input type="checkbox"/>	Do not visit other people with livestock during outbreaks. If you do, wear clean clothing and footwear that is not worn on your farm while tending your livestock. Thoroughly clean and disinfect footwear before entering your vehicle or returning to your farm. Launder clothing immediately upon return (include hats, gloves, and coats). Shower and change clothing before visiting your own poultry/livestock.
<input type="checkbox"/>	<input type="checkbox"/>	Do not visit commercial poultry/livestock operations or allow their employees to visit your poultry/livestock yards.
<input type="checkbox"/>	<input type="checkbox"/>	Prevent sick people from coming into contact with sick animals. Have a friend or family member tend stock if you become ill.
<input type="checkbox"/>	<input type="checkbox"/>	Do not go duck hunting or visit shorebird areas during a disease outbreak.
<input type="checkbox"/>	<input type="checkbox"/>	When traveling, avoid all contact with livestock, poultry, and other birds.
<input type="checkbox"/>	<input type="checkbox"/>	When returning from a trip to a potentially infected area/country, avoid contact with any poultry/livestock for four days.
<input type="checkbox"/>	<input type="checkbox"/>	Wash hands frequently, especially before and after handling any poultry/livestock.

Equipment as Transmission Vectors

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Clean vehicles and trailers periodically, especially tires, where dirt and debris can easily lodge in the treads. If this equipment travels outside of the farm, clean and disinfect upon return. (Visiting a good car wash prior to returning is ideal.)
<input type="checkbox"/>	<input type="checkbox"/>	Separate off-farm vehicle areas from areas accessed by livestock to prevent accidental disease transmission. For example, chickens should not range in the driveway.
<input type="checkbox"/>	<input type="checkbox"/>	Encourage buyers/haulers to meet at a neutral off-farm point or limit their access to your property.

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<input type="checkbox"/>	<input type="checkbox"/>	If vehicle access on your property is necessary, spray the tires and undercarriage of the vehicle with disinfectant prior to entry and allow only within designated off-farm vehicle areas.
<input type="checkbox"/>	<input type="checkbox"/>	Do not borrow or lend crates or equipment.
<input type="checkbox"/>	<input type="checkbox"/>	Disinfect crates and equipment when returning to property. If used equipment is acquired, clean and disinfect thoroughly. Let the items sit outdoors in the sun for a week to allow sunlight and fresh air to kill all pathogens before moving to poultry/livestock areas.
<input type="checkbox"/>	<input type="checkbox"/>	Remove unused furnishings or equipment from livestock and poultry facilities.
<input type="checkbox"/>	<input type="checkbox"/>	Do not share incubator or incubate eggs from other flocks.

Animals as Transmission Vectors

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Quarantine all new animals for a minimum of three weeks.
<input type="checkbox"/>	<input type="checkbox"/>	Quarantine all returning animals for a minimum of three weeks.
<input type="checkbox"/>	<input type="checkbox"/>	Purchase only healthy animals, birds, chicks, or eggs from reputable sources (preferably, for poultry, from NPIP certified flocks).
<input type="checkbox"/>	<input type="checkbox"/>	Do not purchase animals or birds during outbreaks of disease.
<input type="checkbox"/>	<input type="checkbox"/>	Do not lend stock.
<input type="checkbox"/>	<input type="checkbox"/>	Supply feed and water indoors to discourage wild birds.
<input type="checkbox"/>	<input type="checkbox"/>	Prevent wild birds feces from getting into clean pens. Don't track manure in on shoes and don't let birds in.
<input type="checkbox"/>	<input type="checkbox"/>	During times of poultry disease threat, net over waterfowl area or use tents to enclose waterfowl and to prevent contact with wild waterfowl.
<input type="checkbox"/>	<input type="checkbox"/>	Fence your poultry/livestock away from water areas, such as ponds or streams, to remove the possibility of contracting or spreading disease.
<input type="checkbox"/>	<input type="checkbox"/>	Limit contact of livestock and poultry with other domestic animals, like dogs and cats.
<input type="checkbox"/>	<input type="checkbox"/>	Control insects around and in poultry/livestock buildings – flies, beetles, roaches and other insects.
<input type="checkbox"/>	<input type="checkbox"/>	Do not feed poultry/livestock feed meant for another species, such as hog feed to geese; this avoids feeds that may contain poultry/livestock byproducts as a protein source from being fed to the same species.

Exhibition Transmission Vectors

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Do not show when there is a risk of disease exposure.
<input type="checkbox"/>	<input type="checkbox"/>	Have your poultry/livestock properly tested for all health requirements.
<input type="checkbox"/>	<input type="checkbox"/>	Do not show any recently vaccinated poultry/livestock as these may transmit disease.
<input type="checkbox"/>	<input type="checkbox"/>	Show only poultry/livestock in the peak of health, do not bring any that are showing signs of stress.
<input type="checkbox"/>	<input type="checkbox"/>	Check the poultry/livestock penned near your own and report any unhealthy specimens to the show management.
<input type="checkbox"/>	<input type="checkbox"/>	Also, report to show management any unhealthy poultry/livestock seen while walking the show or sales areas.
<input type="checkbox"/>	<input type="checkbox"/>	Wash your hands after handling someone else's poultry/livestock and before handling your own.
<input type="checkbox"/>	<input type="checkbox"/>	Quarantine your returning poultry/livestock for three or more weeks.

Potential Cross-Infection Points

Avoid high traffic locations that are likely to be visited by others with poultry or livestock. A few include:

- Feed stores
- Livestock and poultry auctions and sales
- Poultry/livestock shows
- Animal processing facilities
- Hardware stores
- Convenience stores
- Restaurants/fast food stores
- Gas stations

Education and Recordkeeping

The goal of a biosecurity plan is not only the prevention of disease, but also the ability to demonstrate an absence of risk. Biosecurity Plan implementation, personnel education, and recordkeeping are tools that accomplish this goal.

<i>Routine</i>	<i>Crisis</i>	
<input type="checkbox"/>	<input type="checkbox"/>	Obtain biosecurity training and maintain proof of that training. (Date of training _____.)
<input type="checkbox"/>	<input type="checkbox"/>	Develop a biosecurity plan for your farm. (Date of implementation _____.)
<input type="checkbox"/>	<input type="checkbox"/>	Educate all family and farm labor on biosecurity plan. (Date of training _____.)
<input type="checkbox"/>	<input type="checkbox"/>	Obtain biosecurity materials from state and federal Departments of Agriculture.
<input type="checkbox"/>	<input type="checkbox"/>	Post this and other biosecurity information in your office, barn, or henhouse. (Date of posting _____.)
<input type="checkbox"/>	<input type="checkbox"/>	Keep record of all poultry/livestock bought and sold along with the name of those selling/purchasing the poultry/livestock – maintain records for five years.
<input type="checkbox"/>	<input type="checkbox"/>	Obtain copies of health paperwork from seller for all new poultry/livestock purchased. Maintain for at least five years.
<input type="checkbox"/>	<input type="checkbox"/>	Keep a health history for your flock/herd. Record all disease or health issues, date, treatment, and outcome. Record all vaccinations and include batch serial number, type of vaccine, and vaccination date – maintain permanent record of flock/herd history.
<input type="checkbox"/>	<input type="checkbox"/>	Keep record of all visitors.

Additional Protocols

Please list any additional protocols that you plan to implement to protect your livestock and poultry from disease.

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Resources

American Livestock Breeds Conservancy, PO Box 477, Pittsboro, NC 27312, (919) 542-5704, albc@albc-usa.org, www.albc-usa.org/biosecurity.html.

American Poultry Association, *Vaccination Guide*, www.amerpoultryassn.com/vaccination_guide.htm, American Poultry Association, PO Box 306, Burgettstown, PA 15021, (724) 729-3459, apasecretary@aol.com, www.amerpoultryassn.com.

American Pastured Poultry Producers Association, 36475 Norton Creek Rd, Blodgett, OR 97326, (541) 453-4557, grit@apppa.org.

ATTRA - National Sustainable Agriculture Information Service, PO Box 3657, Fayetteville, AR 72702, (800) 346-9140 (English), (800) 411-3222 (Español), www.attra.ncat.org/.

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