Avian Flu and You

By Don Schrider

Over the past few months, many people have contacted ALBC looking for good information on avian influenza and wanting to know what ALBC suggests they do to protect both themselves and their flocks. To better answer their questions, ALBC has spent considerable time researching this issue and planning, so that we can offer the best information and suggestions possible. As part of this research, I attended the *Industry Extension Workshop on Avian Influenza,* hosted by the Animal Production Systems of the U.S. Department of Agriculture, at the U.S. Poultry & Egg Association International Exposition in Atlanta, Georgia, in January. Below are the facts that we have uncovered and our suggestions on how to protect yourself and your livestock.

What Is Avian Influenza

There are many viruses in the Orthomyxovirus family, including human influenza and avian influenza. These viruses are naturally occurring and circulate around the world. Influenza viruses infect a host and use the host's cells to reproduce more virus. When you have the "common flu" this is what is happening within your body. These Orthomyxoviruses are usually host specific – that is, they have adapted to infect a certain host species. Avian influenza has adapted to infect avian species and is known as a "type A virus."

There are many strains of avian influenza (AI), just as there are for human influenza. These strains are differentiated by differences in hemagglutinin protein, which gives the strain an "H" group number, and by neuraminidase protein, which gives the strain an "N" group number. There are 16 H groups and 9 N groups, which amounts to 144 different characterizations. Because these viruses are constantly mutating, not all avian influenza viruses with the same characterization are the same – there is more than one H5N1 strain, for example. Additionally, these strains are further divided based on virulence. All high pathogenic (HP) avian influenza (AI) must be of the H5 or H7 strains, though most H5 and H7 strains are low pathogenic (LP). High pathogenic avian influenza (HPAI) viruses are defined as being lethal for 75% or more of intravenously inoculated susceptible chickens (4 to 6-weekold birds). HPAI's rapid spread exhibits high mortality, severe depression, and a decrease in food and water consumption. The disease peaks 5 days after introduction. In caged birds the disease spreads more slowly and results in 100% mortality 10 to 15 days after introduction. Signs of this disease include abnormal nervousness, swollen dead combs and wattles that turn black as a result of blood clotting, and swollen legs and feet.

HPAI is a systemic disease and virus can be found in the meat, blood, and bones. LPAI is a respiratory and reproductive disease and cannot be found in the meat, blood, and bones, but virus can be found in the lungs and reproductive organs. HPAI can be found in the meat of ducks and chickens, while LPAI can never be found there.

Slight differences distinguish strains of HPAI H5N1. The HPAI H5N1 sub-strain z, as now found in Southeast Asia, is the specific strain of disease of current concern. A distinguishing symptomatic characteristic of this strain is that it causes lungs to fill with fluid; most other avian influenza strains do not. Once an avian influenza strain adapts to domestic poultry it VERY

rarely readapts and returns to wild birds. HPAI H5N1 sub-strain z, as found in Southeast Asia, HAS readapted to wild birds.

The current concern worldwide about HPAI H5N1 sub-strain z is that it may cross the species barrier, becoming transmissible to and between humans and resulting in a pandemic. Low pathogenic strains, also referred to as avian influenza, are of little or no concern. The lack of understanding of the distinction between HP and LP avian influenza has caused some misleading media reports and fear amongst the general public. Again, most strains of avian influenza are of little or no concern.

Where Does AI Come From?
Avian influenza viruses are naturally occurring. Wild waterfowl are considered the reservoir for the disease; LPAI H5 or H7 is found in wild waterfowl. But there is current debate on whether or not wild waterfowl are the source of HPAI H5N1, or simply victims. It is known that HPAI H5N1 has been found in domestic chickens, both confined and free ranging, and in wild migratory waterfowl.

AI viruses mutate easily and frequently. Given the right opportunity – many hosts, close proximity of these hosts, conducive environment, and, optionally, other AI viruses to exchange DNA with – new AI strains emerge. The lack of new hosts causes strains to "burn out" or cease. This is why depopulation is used as a primary tool in fighting HPAI outbreaks.

It is extremely rare for an influenza virus to mutate so that it can infect other species. The HPAI H5N1 found in Southeast Asia has crossed a number of species barriers and can infect cats, tigers, leopards, pigs, as well as domestic waterfowl and landfowl. Ducks can become infected but show no signs of illness.

What Is the Human Health Threat?
In the ten years since its emergence, HPAI H5N1 sub-strain z, as found in Southeast Asia, has infected approximately 200 people and has caused the deaths of just over 100 of these. Only 3 cases of human-to-human transfer have occurred and in each of these the disease spread no further. To better understand the scale this represents, in America alone approximately 10,000 people die from human influenza each year.

There is concern that a new highly pathogenic human influenza can be created by DNA exchange between HPAI H5N1 and a human influenza virus. Humans would have no defense against such a virus, causing a pandemic. While experts do disagree on the likelihood of such a pandemic, those who believe it unlikely cannot rule out the possibility entirely.

What Is the History of AI in the U.S.?
You may remember the media mentioning AI outbreaks in the U.S. previously. Most of these have been cases of low pathogenic AI. A connection with LPAI and the live-bird markets has been acknowledged. Live-bird markets are places where a customer picks out a live bird, which is then processed by the market for that customer – the customer takes home the processed bird they chose. LPAI has been found in the live-bird market system, and despite depopulations and clean-up efforts the disease re-emerges within this system.

There have been three significant outbreaks of AI in the U.S. in recent years. The first was in Pennsylvania in 1983-84 and was HPAI H5N2. This strain is now considered "dead" as it has not been seen since 1989. The outbreak included both commercial poultry and a backyard flock – significantly, the backyard flock was not found to be the source of the outbreak. In 2002 an outbreak of LPAI H7N2 occurred in Virginia. Depopulation of infected birds was successful in halting the spread of this disease. No backyard flocks were infected in this Virginia outbreak. The most recent outbreak was in Texas in 2004 involving HPAI H5N2 of a different strain. One backyard flock near the infected commercial flocks was infected during this outbreak. There is currently no HPAI in the U.S.

Are My Poultry a Threat?
Healthy poultry are not a source for this disease. President Franklin Delano Roosevelt once said, "The only thing we have to fear, is fear itself." Keeping your poultry healthy is the most important thing you can do. Don't give up your poultry out of fear.

Thinking they are protecting their families, people around the world are killing or selling the poultry they depend upon as a source of income and low-cost protein. This response may cause a significant loss of genetic diversity in rural stocks of poultry and will likely cause more dependence on commercial poultry, even by the rural poor. Fear may cause more depopulation of poultry than actual outbreaks of this disease.

How Can I Protect My Family and Animals?
Use good common sense to protect your family and your animals. Though it is thought very unlikely that infected poultry or poultry products could enter the marketplace, simple food safety protocols will protect you. Both HPAI and LPAI are easy to kill. Common disinfectants will kill influenza virus in your home and kitchen. Influenza virus dies when dried out, exposed to sun, or when heated to 158 degrees Fahrenheit. Proper handling and thorough cooking of poultry and poultry products, as should be practiced routinely, kills the disease. The Food Safety and Inspection Service (FSIS) suggests that cooking to an internal temperature of 165 degrees Fahrenheit will kill all pathogens and viruses. Pasteurization also kills avian influenza. Cold does not kill influenza viruses; always be cautious to bring reheated poultry dishes up to proper temperature.

One should take precautions while working with or around livestock too. Dead poultry should be handled carefully, preferably with rubber gloves, and disposed of properly. If concerned that you may have handled infected poultry without protective gloves, washing your hands for 10 minutes with any common household detergent will kill disease-causing agents. To help prevent possible mutation of avian influenza virus, sick people should not care for livestock. This should be enforced with all hired labor, too. Sick animals should be isolated from healthy animals – feed and water these after tending the others. Wash your hands after each barn visit.

To keep your livestock healthy, practice common biosecurity protocols. Maintain a set of boots and jacket that you wear only on your farm while tending your livestock. Never wear "barn boots" or your "barn jacket" off property or to common cross-infection points such as feed stores, gas stations, restaurants, hardware stores, tractor dealers, convenience stores, or county or

state fairs. Visitors to your farm should not wear their barn boots, and whatever footwear is worn should be disinfected at your farm before being allowed into livestock areas. A footbath using bleach, or other common disinfectant readily available, is effective. In a pinch, plastic bags can be used to cover visitors' footwear and/or Lysol can be used to disinfect the soles of their shoes. Prevent the introduction of disease by purchasing only healthy animals from reputable sources, preferably sources that have tested clean for disease. Avoid purchasing new exotic birds or pigeons if you maintain poultry. Birds arriving from countries with an outbreak of avian influenza could bring disease to your property. Exercise caution on all new purchases. Quarantine all new or returning livestock for 30 days.

Control the introduction of disease by preventing or limiting contact of domestic animals with wild animals. Increase efforts to control rodents. Control wild bird contact by keeping food and water reservoirs indoors; utilizing wire or bird netting to prevent and discourage access; removing or moving wild bird feeders (to keep birds away from farm animals); and discourage nesting in or around barn.

Infected droppings can contaminate water sources as well as poultry. In the Thailand HPAI H5N1 outbreaks in village poultry, statistical analysis revealed a connection between wild waterfowl and the outbreak of disease. The correlation implies that domestic ducks, which are brought to the harvested rice paddies to glean spilled rice and snails, likely came into contact with infected wild waterfowl or drank water infected by the wild waterfowl. These ducks could have contracted the disease but shown no symptoms, transmitting the disease to village chickens when later housed together. It is therefore recommended to prevent contact between wild waterfowl and domestic poultry. Separating your domestic waterfowl from domestic landfowl would be a good additional biosecurity practice as well.

When attempting to prevent the disease, remember that avian influenza can be transmitted over short distances by airborne droplets, such as a sneeze, by exposure to infected droppings, by exposure to contaminated water, and by feed in which infected droppings or feathers have been used as a protein source.

Don't Put All of Your Eggs in One Basket

Disease threats and natural disasters can have serious consequences for rare breeds of livestock. This is especially so when a population is concentrated in one area. ALBC has long recommended that breeding stock be shared amongst stewards rather than concentrated into the hands of one steward. The threat of avian influenza gives good reason for stewards to share their stock now, while there is no disease, to help ensure survival.

Conclusion

In the midst of all the confusing and intimidating media coverage of avian influenza, one should remember these simple facts: Normal, proper handling and cooking of meat and eggs will prevent consumers from contracting this disease or any other food-borne disease. Normal, healthy poultry pose no threat to other poultry or to humans. The sky is not falling.

The American Livestock Breeds Conservancy is working to prepare *Biosecurity and Health Protocols* and a *Biosecurity Plan* for backyard and small-scale poultry keepers. Please visit our website at *www.albc-usa.org* to download a free copy of these to help keep your flock healthy.

Other Links of Interest:
Center for Disease Control site on avian influenza: http://www.cdc.gov/flu/avian/
Center for Disease Control presentation on avian influenza:
http://www.cdc.gov/flu/pp/biosecurity_on_farm_11_2004.pdf
USDA's site on biosecurity and avian influenza:
http://www.aphis.usda.gov/vs/birdbiosecurity/hpai.html
National Defense University poster to prevent contraction and spread of influenza:
http://www.ndu.edu/ctnsp/life_sci/TheBirdFluandyou%20Big%20Final.pdf
Purdue University Biosecurity website with disinfectant database:
http://www.biosecuritycenter.org/
Prevention – A young Person's Guide to Keeping Animals Safe and Healthy:
http://www.vet.ohio-state.edu/1985.htm