

Poultry Voice

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Poultry Health & Well Being

Today's poultry industry involves the intensive raising of birds for meat, eggs, and chicks. Due to the population of birds in a house and the proximity of houses on a farm, it is easy for an infectious agent, after it enters a farm house, to spread among the birds and cause a disease. A challenge in today's poultry business is to make sure that such disease outbreaks are rare, and that when they do occur, they do not have devastating economic consequences for the individual producer, the integrator, and the poultry community.

It is up to the producer to manage the farm and the buildings in such a manner that disease agents do not find it easy to enter to infect birds. It is also the producer's duty to provide an environment (temperature, good-quality feed, good-quality water at a comfortable temperature, ventilation, humidity, vaccinations) that does not stress the birds, so that if an agent infects them, they are strong enough to resist the infection to a greater extent.

In order to keep infectious diseases at bay, it is imperative to maintain a healthy flock, practice good management practices, maintain a good relationship with flock supervisors, and take their advice. They are there to make sure flocks stay healthy and profitable. Producers should make sure to understand their birds in order to recognize anomalies or subtle changes and report them to the company veterinarian and flock supervisor. Abnormal smells, sounds, abnormal

activity or inactivity, excessive discharges, excessively wet droppings, or unusual body conformation or stance, will give an idea of the flock's health. Keeping good records will help trace the beginning of abnormal behavior or changes in the flock.

What does the bird itself do to ward off diseases? Skin and feathers form a physical barrier against entry of foreign organisms. When something does get past these first lines of defense, the immune system goes to work. The first thing the immune system does is to recognize the organism as new (never been infected with it before) or old (have had exposure to it before), and then set about to produce antibodies to destroy, engulf, neutralize, or remove it before it adversely affects the body's system or disseminates throughout the body.

The ability of the individual bird or the flock as a whole to fight off the foreign agent depends on the pathogenic agent's virulence, the concentration or dose, and the fitness or stress status of the birds themselves. The ability of the immune system to recognize an agent to which it has been exposed before is the basis of vaccinations. During vaccinations, birds are exposed to infectious or disease agents in some nonvirulent or reduced virulent form so that the body becomes used to the agent and has an opportunity to produce antibodies against the agent. When and if the bird is exposed to the same or similar agent, the immune system "remembers" and is able to produce antibodies at a faster rate to combat the infection. This is why the poultry industry vaccinates baby chicks





against certain diseases as part of good management practices (eg., Marek's disease - MD, New Castle disease - NCD, infectious bursal disease - IBD, and infectious bronchitis - IB).

Certain diseases are caused by agents that specifically target the immune system in order to more effectively do damage. By doing this, they make the bird more

susceptible to other diseases. When birds become immunosuppressed they are more prone to infection by secondary agents. Vaccinating against the immunosuppressive agents helps the birds have a good start in life and also makes sure that their immune system gets a chance to become well established in order to protect against other diseases.

An Overview of Some Poultry Viral Diseases

Fowl pox - FP

This slow-spreading disease can be one of two forms, cutaneous (dry) or diphtheritic (wet). They can occur at the same time. It is a common disease of both chickens and turkeys, and infection can occur at any age. The cutaneous form is milder and with low to no mortality. It is manifested by the production of warts on the face, legs, and feet. The wet form affects the respiratory system, with the development of lesions and cheesy exudates, which ultimately lead to death by suffocation. It can spread by means of aerosols, insects (including mosquitoes), lacrimation, fomites, and handling. Susceptibility depends on the flock and mortality may be zero with the dry form to about 50% for the wet form. Growth retardation, blindness, reduced egg production, and impaired fertility may also result. Those with dry pox have a greater chance of recovery than those with wet pox. The incubation period may be anywhere from 4 to 10 days. The disease usually lasts about three to four weeks, but in some cases may be twice as long. Under normal circumstances, it does not affect mammals and has no health significance for humans. Recently there have been new cases of the diphtheritic form even in vaccinated flocks so there may be a need for the development of new and better vaccines.

Infectious laryngotracheitis - ILT

This herpesvirus results in a severe respiratory disease of chickens and pheasants (turkeys are not normally affected). The virus is spread through aerosols and droplets, and may be spread by manure application on land, but the most important method is by man. The incubation period may be a week to two weeks. The virus can gain entrance into a flock by the introduction of nonvaccinated birds and birds from different sources. A significant source of the virus is backyard and fancy, exhibition or game birds. Signs and symptoms vary depending on the strain, pathogenicity, and susceptibility of the flock. Mild cases have respiratory distress, conjunctivitis, watery eyes, and nasal discharge. A severe case, however, may be due to a secondary infection by opportunistic pathogens, which invade the respiratory system to cause a systemic infec-

tion. When this occurs, symptoms may include production of blood-stained mucous, gasping, coughing and sneezing, and death due to an inability to breathe. Mortality in severe cases may reach 70%. ILT causes some birds to become carriers so there is always the chance of further outbreaks. Usually chickens recover within two weeks, but sometimes it takes twice as long. The one significant thing to do is not to mix birds from different sources or of different ages.

Affected flocks should be segregated from other houses, and strict biosecurity measures should be taken to prevent further spread. Infected birds are usually vaccinated by the eye-drop method or through drinking water. In addition to vaccination to protect uninfected birds and shorten the duration, biosecurity measures must be adhered to. Some of the vaccines used have a tendency to cause carriers in chickens and are also mildly pathogenic, and so should be used only for infected flocks or in areas where the disease is endemic.

Avian encephalomyelitis - AE

This virus can cause disease in turkeys, pheasants, and coturnix quail, but it primarily affects chickens. It is distributed worldwide. Manifestations differ depending on the age of the birds. In adults, a slight drop in egg production may be noticed, but younger birds develop a lack of muscle coordination leading to tremors and death. In some flocks some of the birds develop blindness.

The virus is very resistant and can be spread through fecal material of infected birds. Because it is a hardy virus, it can also be spread by man and fomites, but the primary method of spread is through infected hens via chicks, and through their feces to others in the poultry house. When chicks get the virus through the egg, they usually die within a week. When they acquire it from other chicks they can shed the virus up to three weeks of age and acquire resistance by the fifth week. Mortality may be from 25% to over 50%. This disease was of economic importance in commercial flocks before effective vaccine use in the 1960s.



Avian influenza - AI

Avian influenza is caused by an influenza A virus with different antigenic subtypes. It affects both domestic and wild birds but is particularly pathogenic for turkeys and chickens. It is extremely infectious and has signs and symptoms that mimic those of other diseases. These include reduced egg production, respiratory distress, depression, cyanosis of exposed skin, swelling of head and face, nervous disorder, diarrhea, increased lacrimation, huddling, ruffled feathers, etc. On the other hand, birds may simply start dying without any apparent clinical signs.

All domestic and wild birds (particularly ducks), are a source of the virus. There seems to be a persistent reservoir in live bird markets on the East Coast and in backyard flocks. It is not particularly resistant, but it can survive for long periods under cool, moist conditions. High heat and pH as well as disinfectants like formalin can destroy it. Poultry litter and manure can be composted to generate enough heat to destroy the virus.

Avian influenza is not normally a health risk for humans (there is one recorded incidence in Hong Kong in 1997 where a virus affecting chickens infected people and killed six), but it is devastating to the poultry industry. It can be of low pathogenicity with a low level of mortality and then without changing subtypes, can become very virulent with an increase in mortality. Vaccinations may be used for an infected flock, but since certain birds can become infected and shed the virus, vaccinations are not usually used to control outbreaks. Affected farms are quarantined, flocks depopulated, and the houses cleaned and disinfected. After this, the houses are left empty until testing turns up negative. At that time, they may be restocked with birds. The best way of controlling the spread apart from depopulation is by adhering to strict biosecurity measures.

Newcastle disease - NCD

This paramyxovirus can affect several species of birds although lethal strains for chickens may have no effect on ducks and geese. The virus is spread in most of the usual ways with one very important addition—exotic birds, game birds, and especially racing pigeons. Feed contaminated by pigeon droppings was the cause of a serious outbreak in the United Kingdom in 1984. Humans have also been implicated in dissemination of the virus.

The incubation period can vary from two days to two weeks, and the onset of symptoms depends on the virus and the flock in question. The viruses are characterized by the main areas of infection; viscerotropic strains attack the viscera and are transmitted via the feces, pneumotropic strains attack the respiratory system and are disseminated via aerosols, and neurotropic strains attack the nervous system. Signs and symptoms of the neurotropic velogenic (severe) virus include respiratory distress, neurologic signs, reduced egg production, and no diarrhea. Mesogenic (moderately severe) strains also cause respiratory disease and reduced egg production. Lentogenic (mild) strains do not infect adults but cause respiratory disease in young birds. Viscerotropic velogenic strains make birds listless and weak, have increased respiration rates and then become prostrate and die.

Vaccination is effective in limiting the severe form of the disease although some birds become shedders. To vaccinate or not depends on the local situation and the type of bird. Where NCD is not a significant threat, birds like broilers with short life spans may not be vaccinated but laying hens may be vaccinated, usually with more than one dose to carry immunity through their life span.

Other control measures apart from good biosecurity programs, include regulation against exotic, pet, and racing birds.

Infectious bronchitis - IB

This is also known as avian infectious bronchitis. It is only known to naturally infect and cause major disease problems in chickens. Other birds may be affected to some degree. The disease is caused by a highly infectious virus with multiple serotypes. It tends to be more severe in baby chicks, but they become more resistant as they age and mature. Its signs and symptoms include most of the common signs like respiratory disease, coughing, sneezing, lacrimation, swollen sinuses, nasal discharge, and reduced egg production, but may also include damage to the kidneys and reduced feed conversion ratios. One manifestation of kidney involvement is an increase in water consumption with a resultant production of wet feces. Apart from reduced egg production, there may also be a decrease in hatchability and an increase in low quality, malformed eggs. Mortality is usually due to complications resulting from respiratory or kidney failure.



Mortality can be as high as 25% when birds are six weeks or younger. Usually, mortality is negligible in birds above that age. The virus can be spread through aerosols and fecal material and can persist for long periods, making it possible to infect different flocks in the same house. Birds continue to shed the virus for a long time and therefore the birds themselves are a source of infection. There is currently no evidence that vectors are involved in its spread. Flocks may be vaccinated using live or inactivated viruses as a spray or in water. Usually, this is done at 2 weeks of age (in combination with NCD vaccines), but may also be given at 1 day of age.

Infectious bursal disease- IBD/Gumboro disease

This is a highly contagious viral disease of chickens that targets immune cells, but it also causes serious kidney damage. It is important due to the high rate of mortality in chicks over 3 weeks of age, but also because it tends to cause immunosuppression of young chicks, making them vulnerable to infection by secondary and opportunistic pathogens. The first known outbreaks occurred in Gumboro, Del., and it is still described as Gumboro disease.

There are two main serotypes—serotype 1 normally infects chickens; serotype 2 infects turkeys, ducks, and chickens, but it is not as lethal.

This is a stable virus that tends to persist in poultry houses even after cleaning and disinfection. Feed, water, droppings, and insects from poultry houses can be infectious after considerable lengths of time. Chickens are most vulnerable between 3 and 6 weeks of age. Birds younger than 3 weeks usually develop subclinical signs and become immunosuppressed. Signs and symptoms, which may develop as soon as 48 hours after exposure, may include depression, ruffled feathers, prostration, watery diarrhea, trembling, and finally death. Mortality may be negligible, moderate (20-30%), or high (90-100%). Antibody production is very rapid and there is a fast recovery (about one week), after exposure so birds are not normally treated for the disease. Vaccines are given for immunization, and boosters may be given to breeder flocks to prolong immunity. For day-old broilers, the vaccine may be given together with Marek's disease vaccine.

Marek's disease—MD

This highly contagious disease is caused by a herpesvirus and leads to a variety of signs and symptoms depending on where the lesions appear. Before the use of vaccines, this oncogenic virus was of serious economic threat to the industry. There are three serotypes, with serotype 1 being the only oncogenic and virulent one.

Marek's disease affects chickens, quail, and turkeys, as well as other birds to a lesser extent. Transmission is usually by way of aerosols, dust, and poultry house dust. Onset of clinical signs in the field are not certain, because most serious outbreaks occur in 8 to 9-week-old birds, and time of exposure is difficult to determine. Signs and symptoms include depression, paralysis (sometimes with outstretched limbs), dehydration, emaciation, and blindness. When the virus affects the brain it can lead to a condition known as "floppy broiler syndrome." Currently, due to vaccination of flocks, mortality is about 5%. It is one of the diseases that leads to immunosuppression. There is no effective treatment for the disease, but the use of vaccines at hatching has been very efficient at controlling it.

Hemorrhagic enteritis—HE

Hemorrhagic enteritis is one of the most important diseases of turkeys. The virus usually infects birds over 4 weeks old. Symptoms include depression and death. An acute form affects a small number of the birds and involves blood loss in the intestines, leading to the production of bloody droppings. The acute form does not normally have a high mortality rate. The disease leads to immunosuppression, so even after the disease ceases (6-10 days), secondary infections continue to affect the flock. There is a predisposition to secondary infection with *E. coli*. Mostly all birds in a flock are affected, but mortality depends on the strain and can be as high as 60%. The virus persists in the house environment (litter, feces), and can be spread by fomites.

Chicken infectious anemia/chicken anemia agent/ chicken anemia virus –CIA/CAA/CAV

This is caused by a virus, which leads to immunosuppression and it is associated with a host of other diseases. All these are described collectively as hemorrhagic syndrome, anemia-dermatitis, or blue-wing disease. In blue-wing disease, complete destruction of the bird's immune system leads to infection by clostridial species, resulting in gangrenous dermatitis. This is associated with chickens worldwide, but has no public health significance. The virus is transmitted both through the reproductive system and from bird to bird, but the reproductive route is the most important one. Signs and symptoms appear within 10 to 12 days, and peak at about three weeks. For congenitally infected chicks, a second peak may indicate additional horizontal transmission. For a while, it seemed as if this disease had been controlled worldwide, but there have been increased incidences in Taiwan recently.



Pneumovirus infections – Turkey rhinotracheitis/ Chicken swollen head syndrome

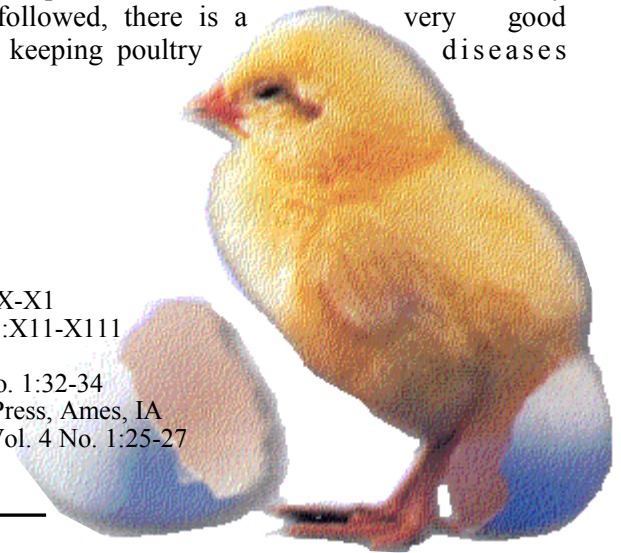
This important disease in turkeys has caused industry losses in Minnesota to the tune of approximately \$15 million in each of the past 4 years. Currently the rate of infection in Minnesota is about 38%, and with better management, mortality and health costs have been reduced. TRT virus causes respiratory problems and immunosuppression. This is one of the diseases that is more severe in tandem with infection from other agents such as *E. coli*, leading to mortality rates as high as 20%. Infection by the virus alone may produce only mild symptoms. Infection of turkey breeders may cause a reduction in egg production. Use of both live and dead vaccines is effective and works very well with an excellent management program. TRT has also affected turkey flocks in Colorado. Swollen head syndrome (SHS) of chickens is believed to be due to the same TRT virus, although there have been outbreaks of SHS not associated with TRT infection.

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Summary

Viral, bacterial, parasitic, and protozoan infections are a normal part of life for man, animals, and birds. The most significant and consistent preventative measure in intensive poultry production, apart from good management practices, is the strict adherence to and enforcement of biosecurity measures. This includes avoiding mixing different types or breeds of birds and different aged birds. It is a very wise idea to follow the rule, **all in all out**. When a disease occurs and is treated, thorough cleaning and disinfection of poultry houses will ensure that the viruses or pathogenic agents do not persist in the environment. If good stock is used, good management practices used, and strict biosecurity practices followed, there is a very good chance of keeping poultry diseases at bay.



Industry Research Update

Sequencing the chicken genome

Scientists in 16 countries are collaborating on a project to sequence the chicken genome. This joint venture involves the Beijing Genome Institute, the Wellcome Trust, and BBSRC in the UK, and several other European countries. They anticipate that by 2006 they would have about 95% of the genome sequenced. This sort of information can be used by the industry to identify specific genes for breeding, disease resistance, and other desirable traits that enhance growth and production, while cutting down on susceptibility to diseases. There may also be a possibility to insert genes into chicken genomes to produce human proteins such as immunoglobulins. (T. Okeefe, *Poultry USA*, March 2002).

In-ovo vaccinations for turkeys

Embrex Inc. has conducted tests showing that the use of in-ovo vaccinations for turkeys is feasible and practical. Tests indicated that the optimal time for injection of the eggs was on the 25th day. In-ovo vaccination currently is used in the broiler industry for delivery of Marek's, fowl pox, and infectious bursal disease vaccines. There is hope that when there are more licensed turkey vaccines available, they will be used by the in-ovo method. Field and laboratory trials of in-ovo administration of turkey rhinotracheitis have shown promising results. Work currently under way is testing a Newcastle disease virus for turkeys for in-ovo administration. Some of the advantages of in-ovo administration of vaccines are more uniform delivery of vaccine, less stress for day-old chicks due to handling, and earlier immunity for chicks treated in this manner. (A. P. Avakian, *Embrex, Inc.*, - *International Hatchery*, 2002. Vol. 16, No. 6:15).



Test detects immune modifying poultry protein

A previously little-understood protein could be used to monitor poultry health, according to studies by Agricultural Research Service (ARS) scientists. When chickens and turkeys become infected with different bacterial and viral diseases, the resulting inflammation causes physiological changes, including decreases or increases in concentrations of some serum proteins called acute phase proteins (APPs). These amplify immune responses by recruiting other cells to the inflammation site to provide early infection resistance. APP concentrations remain detectable in the blood until recovery, offering potential for diagnostic or prognostic tools for poultry producers.

Ovotransferrin, an iron-binding protein, is abundant in poultry blood and eggs. Scientists at the Poultry Production and Products Safety Research Unit in Fayetteville, Ark., found that blood concentrations of ovotransferrin (OTF) increase in chickens with infections. They determined that OTF is a major APP in chickens. Its antimicrobial activities are probably related to its ability to block the availability of iron, an essential element for bacterial growth.

OTF was identified and characterized by Hang Xie, a former graduate student working in the ARS laboratory. The researchers developed a test, called an enzyme-linked immunoassay, to detect and measure the levels of OTF in the blood. They believe these OTF levels can be used as an indicator of health problems in poultry, according to Narayan Rath, a research physiologist at the Fayetteville lab.

A better understanding of the roles of disease-modifying APPs in serum could lead to new approaches for improving natural disease resistance in poultry--such as developing genetic markers that breeders can use to select poultry able to more effectively fight off disease. Companies have shown interest in working with the laboratory to license the enzyme-linked test. Other potential collaborations involve developing a diagnostic marker based on OTF to determine the health of birds during meat inspections, either before or after slaughter (ARS News Service, February 27, 2002).

Less contaminated eggs

Astro Turf has designed a new Extra Performance Nest Pad (XPNP) with improved features. Rounded tops mean more comfort for chickens, and eggs are able to roll onto conveyors without contamination. The open design ensures that manure falls through, so it is easier to clean and overall there are fewer floor eggs. Tests on farms and at research centers show that chickens are comfortable with it. The XPNP was launched in the Netherlands at the VIV Poultry International Exhibition. It is manufactured by Solutia (formerly Monsanto Chemicals) in Belgium (International Hatchery 2002. Vol. 16. No. 6).

Making eggs safer with fast cooling

Research at Auburn University's Poultry Science Department under Drs. Pat Curtis and Donald Conner has used carbon dioxide to cool eggs rapidly from 106 F to 40 F within 90 seconds. Dr. Curtis indicates that keeping eggs below 45 F reduces the chances for bacterial growth. This new cooling system will also allow egg producers to meet new stringent requirements from the Food and Drug Administration. The use of carbon dioxide can extend the average life of an egg from 30 to 60 days. This process of cooling will add 3 to 10 cents per dozen eggs, compared to an extra \$1 per dozen for irradiated eggs (C. McIntosh, Scripps Howard News Service, April 30, 2002).

IGEN *Salmonella* test approved by NPIP

The National Poultry Improvement Plan (NPIP) has approved the use of a rapid detection test for *Salmonella* in live poultry. The test had equal or enhanced sensitivity when compared to conventional nonrapid tests. With a processing time of 48 hours, it is faster than most conventional tests. The decision was made at the recent NPIP biennial meeting held in Texas from May 30-June 1, 2002.

According to the USDA, the incidence of *Salmonella* in poultry products has decreased from about 20% to about 10.7% as a result of its Pathogen Reduction Hazard Analysis Critical Control Program (HACCP). This correlates with a report by the Centers for Disease Control (CDC) that there is a decline in illnesses due to *Salmonella* (*Meat and Poultry*, May 2002).



Worldwide Poultry News

Manitoba egg producers up in arms over American imports

Last April 25, there was a protest at the Manitoba Broiler Hatchery Egg Commission's annual meeting. This was due to the increase in egg importation from the United States. Hatcheries in Canada are allowed to import up to 20% of their eggs. Hatcheries from other provinces are importing American eggs into Manitoba. As a result, Manitoba lost \$1.5 million in egg sales. It seems a decrease in the number of domestic hens is part of the reason for reduced egg production (M. Love, Canadian Poultry, May 2002).

Russia and Japan end ban on U.S. poultry products

Two countries that enacted bans on U.S. poultry and poultry products have finally lifted them. With the Japanese, the primary cause was the outbreak of avian influenza. For Japan, the ban on poultry from Virginia remains through a 90-day period, and excludes anything produced before Feb. 28. Russia lifted the ban in order not to hurt the May summit with President George W. Bush and its entry into the World Trade Organization. The ban remains in effect for 14 plants, which the Russians claim tested positive for *Salmonella*. As part of the agreement with the Russians however, on an interim basis, 10 whole carcasses will accompany shipments of mechanically separated, ground, and comminuted poultry, to be tested for the presence of *Salmonella* (Poultry USA, April 2002 and Meat and Poultry, April 2002).

McDonald's had to suspend sales of its McNuggets to Japan after that country banned poultry imports from the United States due to the outbreak of avian influenza. The bulk of the McNuggets were from Virginia, one of the affected states (Canadian Poultry, May 2002).

Avian influenza in Hong Kong

An H5 virus started to infect chickens in February in Hong Kong. Farms were quarantined and hundreds of thousands of birds killed in an effort to halt the disease. This is similar to the virus that infected and killed six people in 1997 (Meat and Poultry, March 2002).

European Union moves to ban all antibiotics in animal feed

The European Union (EU) has proposed a permanent ban on the use of antibiotics in animal feed. David Byrne, EU food safety commissioner, indicated that all antibiotic use should be phased out by 2006. He also indicated that new regulations will be issued for other feed additives, vitamins, and seasonings. He said companies would have

to reapply for permits and prove that the use of the substances was beneficial for the animals and presented no risk to humans or the environment (J. Lipsky, Meating Place, March 27, 2002)

Indonesia's chicken leg ban ruffles U.S. feathers

Two years ago, the Indonesia Agriculture Ministry issued a ban on the importation of U.S. chicken parts. The reason given was that since U.S. chickens are not slaughtered in accordance with Islamic teachings, the products are not halal and not safe for Muslims. Others think that this is simply an excuse to protect the local industry. The Indonesian Trade Ministry has been trying to have the ban lifted (G. Nirang, Reuters, May 1, 2002).

In the United States

Bayer Corporation, the manufacturer of Baytril, a fluoroquinolone antibiotic, has roped in veterinarians and the food industry to refute assertions in the media against using the drug. They indicate that not only is it not true that use of Baytril in poultry reduces the efficacy of the use of Cipro for anthrax treatment, but also that Baytril is not used for growth promotion and disease prevention. It is used to treat serious disease in less than 1% of chickens (Poultry USA, April, 2002).

Avian influenza in Virginia

The outbreak of avian influenza in Virginia has involved 197 farms and cost over \$120 million. Close to 5 million birds have been depopulated. Birds affected have been turkey breeders (26 farms), commercial meat turkeys (127 farms), broilers (13 farms), broiler breeders (29 farms), and layers (2 farms). At this time, the disease spread is slowing down, and the Virginia Department of Agriculture and Consumer Services and the USDA have started lifting the quarantine on some farms (80); 117 farms still remain under quarantine. The outbreak is due to a low-pathogenic H7N2 strain of the virus. Neighboring West Virginia has had one confirmed positive case. In both states, industry and allied personnel, as well as state, federal, and local agencies, are maintaining a heightened state of alert and continuing surveillance testing.

Zacky Farms relocates

Poultry processor Zacky Farms is moving from Los Angeles to Fresno in order to concentrate on its turkey operation. Zacky sold its chicken processing plant, feed mill, 35 ranches, and a Los Angeles distribution center to Foster Farms. This makes Foster Farms the dominant chicken processor in the West (R. Rodriguez, The Fresno Bee, McClatchy Newspapers, Inc. 06/14/2002).



Lawsuits aimed at the Poultry Industry

Back wages for catchers

The Department of Labor brought suit against Sanderson Farms, Inc., of Laurel, Miss., on behalf of its chicken catching crews. The poultry company will pay back wages to the tune of \$450,000 to 500 catchers. Back wages will also be paid to catchers at five other company plants—four in Mississippi, and one in Texas.

Contractors sue poultry company

About 400 Oklahoma poultry farmers are suing an Arkansas chicken company for roughly \$30 million, alleging the company made millions of dollars by luring them into a losing business deal. "O.K. Industries promises poultry farmers an honest deal--that they will be paid well and paid based on how good a job the farmers do raising chickens," said Charles Goodwin, an Oklahoma City attorney representing the chicken growers. "The reality is that the farmers oftentimes make no more than a poverty-level income."

The federal class action lawsuit filed Wednesday in Muskogee seeks \$75,000 for each farmer who does contract work for O.K. Industries of Fort Smith, Ark. A switchboard operator at the company said officials had not seen the lawsuit and could not comment.

Farmers say they invest about \$200,000 or more in building each chicken house. The lawsuit alleges the chicken houses deteriorate quickly and farmers are not told how their pay is tied to the condition of the buildings. "Unfortunately, the farmers, who have invested hundreds of thousands of dollars to build their chicken houses, are then forced to choose between losing everything or staying with the company," Goodwin said. Farmers then remain at O.K. Industries' mercy for the type of chickens, feed, medication and other supplies used to raise chicks. Goodwin said the farmers' pay is also affected by when the birds are picked up. The lawsuit also alleges that O.K. Industries' pay scale penalizes farmers based on factors they cannot control.

In March, Attorney General Drew Edmondson said he intended to sue a half-dozen chicken companies for allegedly allowing chicken waste to damage Oklahoma water. That threat followed a number of lawsuits against chicken companies, including lawsuits filed by the city of Tulsa (The Tulsa World, 06/01/02).

Donning and doffing compensation

Perdue Farms has agreed to pay back wages for more than 25,000 current and former employees for time spent donning and doffing work clothes and protective wear. This agreement was the result of a lawsuit filed by the U. S. Department of Labor. The department has also filed a similar suit with Tyson Foods, which has indicated that putting on such clothes is a normal part of work (Watt Poultry USA).

Buckeye Eggs out of business

The Ohio Environmental Protection Agency (EPA) revoked wastewater permits for Buckeye Eggs due to repeated violations of environmental regulations. The company had been having problems with environmental stewardship. It settled a lawsuit last year that accused them of inappropriately getting rid of carcasses and manure, and having too many flies. The company is to be sold (Watt Poultry, May 2002).

States up in arms over livestock operations

Special interest groups all over the country and various states are suing meat and poultry producers over everything including the size of their operations, amount of ammonia released to the atmosphere, amount of litter and manure produced and how they are disposed off, odors produced, flies from operations, etc. Currently, some states are restricting locations (Idaho) and sizes (Missouri) of new livestock operations. In Pennsylvania, some cities are preventing large companies from owning or operating farms in their communities (Meat and Poultry, April, 2002)

New EPA meat and poultry products effluent guidelines

EPA's proposal to rescind the dry litter exemption status of poultry farms does not seem fair to National Chicken Council (NCC) communications director Richard Lobb. He indicates that the poultry industry has been proactive in having litter plans addressing issues of nitrogen and phosphorus and that the industry is concerned about environmental issues. Rules and regulations not only affect large companies but in all likelihood will drive small and family-owned farms out of business.

New guidelines aimed at the meat and poultry industry tightens effluent standards for wastewater discharge by processing facilities. Industry personnel have said that EPA based its guidelines on information from 26 site visits (less than 0.5% of facilities) and that it cannot use such a small pool of data to regulate the whole industry. Industry personnel indicate that complying with the new regulations will mean costs of between \$2 million and \$6 million for large processors and about \$1 million for small operators (Meat and Poultry, April, 2002).

OSHA targets meat plants with large immigrant workforce

Despite an overall decrease of 2% in workplace fatalities, the Occupational Safety and Health Administration (OSHA) is going to scrutinize industries with large immigrant populations because of an increase of 11.6% (more than 800) in fatalities among Hispanics on the job in 2000. OSHA will be looking at documentation and visual evidence (posters, videos, live presentations in the native language) that the companies are actually doing more to reduce the incidence of illness and injuries among Hispanics (Meat and Poultry, May, 2002).



WVU Poultry-Related Research

Bench-scale biofilter for removing ammonia from poultry house exhaust

S.B. Shah, T.J. Basden, D.K. Bhumbla

A bench-scale biofilter was evaluated for removing ammonia (NH₃) from poultry house exhaust. The biofilter system was equipped with a compost filter to remove NH₃ and calcium oxide (CaO) filter to remove carbon dioxide (CO₂).

Removal of NH₃ and CO₂ from poultry house exhaust could allow treated air with residual heat to be recirculated into the poultry house to conserve energy during winter months. Apart from its use as a plant nutrient, NH₃ removal from poultry house exhaust could lessen the adverse environmental impacts of NH₃ emissions.

Ammonia and CO₂ were measured daily with gas detector tubes while temperatures in the poultry pen and compost filter were monitored to evaluate the thermal impact of the biofilter on treated air. During the first 37 days of the 54-day study, exhaust air from 33 birds housed in a pen was treated in the biofilter. For the final 17 days, NH₃-laden exhaust, obtained by applying urea to the empty pen, was treated in the biofilter. The biofilter system provided near-complete attenuation of a maximum

short-term NH₃ concentration of 73 ppm. During the last 17 days, with a mean influent NH₃ concentration of 26 ppm, the biofilter provided 97% attenuation. The CaO filter was effective in attenuating CO₂.

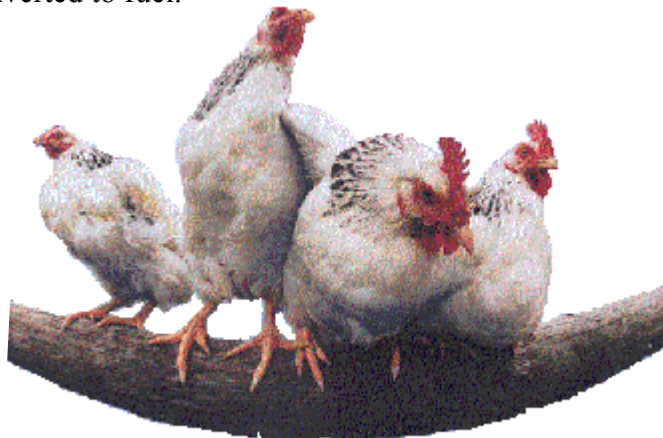
Compared with a biofilter sized only for NH₃ removal, an oversized biofilter would be required to provide supplemental heat to the treated air through exothermic biochemical reactions in the compost. The biofilter could conserve energy in poultry production and capture NH₃ for use as plant nutrient.

Based on this study, a house for 27,000 broilers would require a compost filter with a volume of 1200 cu. ft. There is the need to conduct this study on a larger scale and to evaluate the economics of a biofilter system. Accordingly, a pre-proposal has been submitted to the U.S. Poultry and Egg Association to fund research on evaluating a biofilter for a 5,000-bird poultry house.

On-farm process for converting crop residues and manure into diesel fuel

R. W. Russell, A. H. Stiller, E.K. Johnson

American farms produce large quantities of waste biomass in the form of crop residues and manure. We have found conditions where biomass reacts with water and reforms into liquid fuels. Water is consumed in the reaction, and the mass of fuels formed is approximately 140% the dry weight of biomass substrate. We have tested hog and dairy manure, poultry litter, corn stover, and sawdust. All are suitable substrates for the reaction. Fuel produced from poultry litter has powered a diesel engine operated under a load. The biomass we currently plow under could replace foreign oil if it were converted to fuel.





Impacts of poultry litter application methods on runoff water quality and ammonia volatilization

S.B. Shah, M. Shamblin, D.K. Bhumbra

The traditional method of broadcasting poultry litter on the soil surface in conservation tillage can result in substantial volatilization losses of ammonia, which can have adverse agronomic and environmental impacts. Further, runoff losses of nitrogen (N) and (P) from broadcast poultry litter can also have adverse agronomic and environmental impacts.

A study is under way to evaluate ammonia volatilization and runoff water quality impacts of three poultry litter application methods—broadcast, surface-banded, and surface-banded followed by partial incorporation. Surface banding and surface banding followed by partial incorporation would be useful in both conservation tillage and in pasture production where complete incorporation is not an option.

Quantification of ammonia volatilization was performed using passive samplers over 11 days. Runoff studies were conducted in triplicate on bare micro-plots (3.3 ft X 6.6 ft) prepared for corn planting, using both natural and simulate rainfall over a 1-week period. Runoff samples are being analyzed for nitrate, ammonium, total Kjeldahl N, dissolve ortho-P, sediment-bound ortho-P, total P, and total suspended solids.

If the experimental poultry litter application methods are found to reduce nutrient losses compared with the broadcast method, a proposal will be submitted to evaluate both the agronomic and environmental impacts over multiple crop seasons.

Protein and amino acid metabolism

Dr. Ken Blemings is a faculty member in the Davis College of Agriculture, Forestry and Consumer Sciences at West Virginia University. His research interest is in the area of protein and amino acid metabolism. Specifically, his laboratory is interested in improving the efficiency with which animals, especially poultry, use dietary amino acids for protein synthesis. The students working in the laboratory on poultry projects are undergraduate Melissa Davis (Willow Bend, W.Va.) and graduate students Aaron Kiess (Beverly, W.Va.) and Angela Higgins (Buckhannon, W.Va.). The results of improving the efficiency of amino acid use for protein synthesis would be decreased feed cost and decreased nitrogen-containing waste.

The Blemings' lab is particularly interested in the amino acid lysine. This interest is a function of the importance of lysine in the nutrition of poultry and other farm species. The approach taken is to understand where and how lysine is broken down (degraded) in the chick. By understanding where and how lysine is degraded, it will be possible to develop strategies and technologies to decrease lysine degradation, making more available for protein synthesis. Thus far, the Blemings' lab has found that many different tissues and organs in the chicken's body can contribute to lysine oxidation. However, the liver, intestines, and muscles seem to account for more than 85% of the lysine degradation capacity.

Ongoing studies are aimed at determining the different ways (pathways) that lysine is degraded in these tissues. When it is determined what pathways are important in lysine oxidation, then it will be possible to (1) develop feed additives and/or (2) genetically modify chickens either through selective breeding or biotechnology that results in less lysine degradation and more available lysine for protein synthesis. (This work has been supported by the West Virginia Agriculture and Forestry Experiment Station - Hatch Funds (H-413), a WVU Faculty Senate grant, and funds from the West Virginia University Research Corporation.)

A U.S. Court of Appeals in the District of Columbia has affirmed a ruling by a lower court indicating that Food Safety and Inspection Service's HACCP-Based Inspection Models Project (HIMP) does not violate either the Federal Meat Inspection or the Poultry Products Inspection Acts. The pilot project therefore will continue as of now Poultry USA, May 2002).



Upcoming Meetings

July

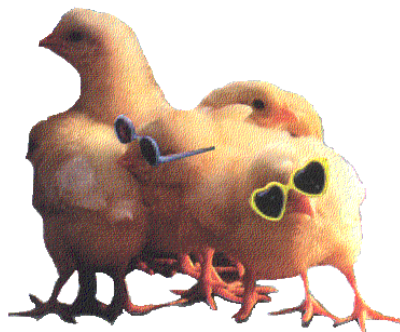
- 9-11 — Conference on Animal and Egg Production Food Safety, San Juan, P.R. 202-690-6497, mary.harris@fsis.usda.gov
- 12-19, 22nd — International Workshop/Symposium on Rapid Methods and Automation in Microbiology, Kansas State University, Manhattan, Kans. 800-432-8222/785-532-5575, minshEl@ksu.edu or www.dce.ksu.edu/dce/cl/microbiology/index.html
- 16-17 — Hatchery-Breeder Clinic, Birmingham, Ala., USP&E Assn., 1530 Cooledge Rd., Tucker, Ga. 30084-7303. 770-494-9401; www.poultryegg.org
- 16-17 — National Turkey Federation Leadership Conference, Westin Fairfax Hotel, Washington, D.C. Sherrie Rosenblatt 202-898-0100 ext. 223, srosenblatt@turkeyfed.org
- 22-23 — National Chicken Council Marketing Seminar. Hot Springs, Va. Maggie Ernst 202-296-2622
- 28-31 — AMSA's 55th Annual Reciprocal Meat Conference, Michigan State University, East Lansing, Mich. 217-356-5374, rachelh@meatscience.org

August

- 11-14 — Poultry Science Association Annual Conference, Newark, Del., PSA 1111 N. Dunlap Ave., Savoy, Ill. 61874. 217-356-3183
- 19-23 — 7th World Congress of Genetics Applied to Livestock Production, Montpellier, France. <http://wcgalp.toulouse.inra.fr>

September

- 6-10, 11th — European Poultry Conference, Bremen, Germany. Congress Partner, Birkenstr17, D-28195 Bremen, Germany +49 421 30 3130, registration2@cpb.de
- 11 — Alabama Processors Workshop, Birmingham Marriot, Birmingham, Ala. Alabama Poultry & Egg Assoc. Wanda Linker, (T) 334-265-2732 (F) 334-265-0008
- 11 — Delmarva Breeder, Hatchery and Grow-out Conference, Delmar, Md., Bud Malone, DPI Inc., 16686 Cty. Seat Hwy, Georgetown, Del. 19947. 302-856-7303
- 12-14 — ESDAR 2002: 6th Conference of the European Society for Domestic Animal Reproduction, Parma, Italy. +39 0521 293913 info@newteam.it
- 18-19 — Poultry Production and Health Seminar, Memphis Tenn. USP&E Assn., 1530 Cooledge Rd., Tucker, Ga. 30084-7303. 770-493-9401; www.poultryegg.org




Poultry Voice is published quarterly to provide those interested in the poultry industry with pertinent production information from industry, academia, and federal and state governments to help ensure economic production of poultry in a manner that sustains the environment. *Poultry Voice* is sponsored by the West Virginia Extension Service.

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