Poultry HEALTH REPORT

A National Institute for Animal Agriculture Publication Spring 2007

CDC Continues to Learn More About Influenza Virus

Center for Disease Control and Prevention (CDC) researchers and their colleagues have identified the molecular properties of the 1918 pandemic influenza virus that affect the virus' ability to spread and have found that transmission can be halted when two amino acids in one of the surface proteins are altered.

The latest CDC work shows that hemagglutinin (HA) protein plays an important role in a virus' ability to spread—and this includes the spread of avian influenza.

For an influenza virus to spread efficiently, the latest CDC research suggests that the virus' hemagglutinin must prefer attaching to cells found in the human upper airway instead of attaching to cells found predominately in the respiratory and gastrointestinal tracts of birds. The findings also suggest that viruses that have hemagglutinin capable of attaching to both human and bird cells equally—without preference for either—would not likely spread easily among humans.

Findings of this work were published in the Feb. 5 issues of *Science* in an article titled "A Two-Amino Acid Change in the Hemagglutinin of the 1918 Influenza Virus Abolishes Transmission."

Capitalizing on research showing that amino acids at positions 190 and 225 in the 1918 pandemic influenza virus hemagglutinin determine its receptor-binding specificity, CDC researchers generated recombinant influenza viruses possessing all eight gene segments of the 1918 influenza virus to examine the role of receptor-binding specificity on replication, pathogenicity and transmissibility of this pandemic strain. Their research mammal: ferrets.

Ferrets were used as subjects as the illness ferrets get from influenza closely mimics human influenza illness. Likewise, the ability of influenza viruses to spread between ferrets also appears to be similar to that in humans.

"The three influenza pandemic viruses of the last century, occurring in 1918 (H1N1), 1957 (H2N2) and 1968 (H3N2), each possessed an HA with a human a2,6 SA binding preference and are thought to have originated from an avian virus possessing the a2,3 SA binding preference," the report states. "It has been postulated that the lack of sustained human-to-human transmission of avian influenza H5N1 viruses is due to their a2,3 SA receptor preference."

"Higher proportions of a2,3 SA receptors in the human lower respiratory tract compared with the upper respiratory tract may explain the

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Inside This Issue...

Clifford Discusses APHIS' Preparations for Potential Outbreaks of AI

"Cooperation and collaboration between the poultry industry and government agencies has contributed significantly to progress in preparing for potential outbreaks of avian influenza," said Dr. John Clifford, deputy administrator for U.S. Department of Agriculture, APHIS, Veterinary Services. Clifford made those remarks during the recent International Poultry Expo, sponsored by the U.S. Poultry & Egg Association in Atlanta in late January.

One such collaboration began well before avian influenza became a major concern in Asia, Africa, and Europe. The National Animal Health Emergency Response Corps, a volunteer group of private veterinarians and animal health technicians who can assist the Veterinary Services program temporarily during an emergency, originated with a call for help from Great Britain during an outbreak of foot-and-mouth disease several years ago.

Dr. John Clifford

"Being able to have personnel with the expertise and the knowledge to be able to respond to these outbreaks is critical," Dr. Clifford said.

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severity of H5N1 viral pneumonia in humans resulting from H5N1 viral attachment deep in the lungs."

In the study, one- and two-amino acid substitutions were introduced into the 1918 virus HA to produce SC18 variants NY18 and AV18. A switch in receptor specificity from an a2,6 SA (human) to an a2,3 SA (avian) binding abolished the transmissibility of the pandemic virus. Although ferrets inoculated with AV18 virus exhibited severe illness and shed high titers of infectious virus in nasal washes, none of the AV18 contact ferrets had detectable virus in nasal washes and post-exposure sera collected from contact animals lacked antibodies against AV18.

The NY18 virus with dual a2,6 and a2,3 SA specificity also resulted in severe illness and death among the inoculated ferrets, but it failed to transmit efficiently. The lack of efficient transmission was not due to the inability of the NY18 virus to replicate to high titers in the upper respiratory tract, including the nasal turbinates. Interestingly, no sneezing was noted among the AV18- and NY18-inoculated ferrets through a 14-day observation period.

The most recent CDC findings raise the possibility that, to become more transmissible, the currently circulating avian influenza H5N1 virus may require a receptor-binding change to a predominant a2,6 SA binding preference.

The researchers caution, however, that "it is likely that different avian HA subtypes have different structural requirements to confer receptor specificity. Thus, it is currently unknown which additional mutations in the H5 HA would cause a shift to the human-type specificity, which may be required for H5N1 viruses to transmit efficiently among humans."

Since recreating a virus matching all eight genes of the 1918 pandemic virus, CDC researchers have continued to study the 1918 virus in an effort to better understand the biological and molecular properties that caused its extreme virulence and transmissibility. The researchers are all too aware that the avian influenza H5N1 virus has resulted in more than 250 human infections, and, of the few avian influenza viruses that have crossed the species barrier to infect humans, H5N1 has caused the largest number of detected cases of severe disease and death in humans. ●

NATIONAL INSTITUTE FOR ANIMAL AGRICULTURE

Poultry Health Report

Spring 2007

Poultry Health Report provides the latest information on issues pertinent to poultry health initiatives, strategies, research and regulatory action. It is a communications initiative of the NIAA Poultry Health Committee and is produced in cooperation with USDA-APHIS. Reprinting is encouraged.

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1918 Flu Virus, H5N1 Avian Influenza Virus: Both Result in Excessive Immune Reaction

Researchers have discovered a strong similarity between the influenza virus that killed 50 million people in 1918 and today's H5N1 avian influenza virus—and this discovery may provide clues regarding how to intervene and stop or mitigate the H5N1's potentially lethal effects.

In a study conducted at the Public Health Agency of Canada's National Microbiology Laboratory in Winnipeg, Man., a team of international scientists led by University of Wisconsin-Madison virologist Yoshihiro Kawaoka reconstructed the 1918 virus using genes obtained from victims' tissues in a reverse genetics process.

"In 1918, the existence of viruses had barely been recognized. In fact, the influenza virus wasn't identified until 1933. Thanks to recent technological advancements, we are now able to study this virus and how it wreaked havoc around the globe," states Darwyn Kobasa, research scientist with the Public Health Agency and lead author of the new study. "This research provides an important piece in the puzzle of the 1918 virus, helping us to better understand influenza viruses and their potential to cause pandemics."

Studying non-human primates infected with the 1918 influenza virus, the team of international researchers found that infection by the 1918 virus prompted an immune response that appears to derail the body's typical reaction to viral infection. With this virus, the immune system unleashes an attack on the lungs. As the immune cells attack the respiratory system, the lungs fill with fluid and victims, in essence, drown. All of this occurs within a matter of days.

The team calls the new findings important because it helps to explain how the virus was so efficiently deadly. The work also suggests that it may be possible in future outbreaks of highly pathogenic flu to stem the tide

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First Egg-Injected Avian Influenza Vaccine Developed

Funds provided through the USDA/CREES/AICAP program between 2004 and present for universities to study avian influenza have played a major role toward the development of an egg-injected vaccine to protect chickens against avian influenza. Auburn University veterinary professor Dr. Haroldo Toro collaborated with researchers at Vaxin Inc., Birmingham, Ala. and at the Southeast Poultry Research Laboratory in Athens, Ga. to develop the new vaccine and says the new vaccine would provide effective protection against highly pathogenic avian influenza strains.

"We have proven the principle, which is the major step in leading to commercially produced vaccine that could be vital to the poultry industry," Dr. Toro states.

To develop the first in-ovo avian influenza vaccine, the researchers inserted the H5 gene from a low pathogenic avian flu H5N9 virus strain, into a non-replicating human virus, a Vaxin proprietary technology. The recombinant virus was then injected into developing chicken embryos. When tested against challenge with a highly pathogenic Vietnamese H5N1 strain or a Mexican H5N2 strain, results showed protection rates of 68 percent and 100 percent, respectively.

"These avian influenza strains have slightly different genetic make-ups which account for the different percentages in protection," Dr. Toro states. "Our results indicate that we can provide very effective protection against any strain when using a gene-insert that has sequence similarity with the field strain of our vaccine construct."

"The in-egg vaccine is easily produced in cell cultures, allows mass immunization via administration into the fertile eggs and has proven very effective," Dr. Toro states.

Unlike killed vaccines produced with the field virus strain, the new egg-injected vaccine allows easy differentiation between naturally infected chickens and vaccinated chickens.

The next step for the vaccine is to gain federal approval for commercial production.

"Obtaining federal approval could take two to three years, but it could move forward faster," Dr. Toro adds.

"We think this is a very good tool against avian flu for several reasons. First, the vaccine allows mass immunization via the in-ovo route of large chicken populations. Secondly, the vaccine protects well against highly pathogenic challenge. Third, it is safe because this recombinant vaccine virus doesn't replicate in the host. Fourth, pre-immunity to the vector, which has been shown to affect the generation of immunity to other recombinant vaccines, is unlikely."

The vaccine could change the landscape of the poultry industry. After all, because the newly developed vaccine is produced through cell cultures, an adequate supply of vaccine could be manufactured in a short amount of time for thousands of birds. Thus, should an outbreak of highly pathogenic avian flu occur, infected birds could be mass euthanized and disposed while mass vaccination programs around the perimeter region would help to reduce the risk of further dissemination of the field virus to neighboring areas. ●

At International Poultry Expo

EPA Official Reviews Agency Initiatives on Air Quality and Agriculture

Explaining that the overall policy of the U.S. Environmental Protection Agency (EPA) is to ". . . work with agriculture to produce solutions," Sally Shaver, Associate Counselor for Agricultural Policy in the agency's Office and Radiation, addressed a number of initiatives regarding animal agriculture (including poultry) at the International Poultry Exposition held in Atlanta in January.

To illustrate EPA's national agriculture strategy, Shaver described an industry-funded air study that operates under a consent agreement which contains a limited covenant that protects participants from Federal regulatory enforcement. More than 2,600 participants representing more than 13,900 poultry, dairy and swine operations in 20 states will participate in this two year study.

"Our goal with this study is to determine what the emissions are from these sources and to use the results to determine the applicability of various regulatory requirements under the Clean Air Act, CERCLA (Comprehensive Environmental Response Compensation and Liability Act), and EPCRA (Emergency Planning and Community Right-to-know Act)," stated Shaver.

Another important area of interest is the regulation regarding particulate matter (PM) and ozone. For example, large dairy operations located in ozone-sensitive areas could be impacted by Federal environmental laws and regulations because of their emissions of VOCs (Volatile Organic Compounds). "This research will give us a better handle on how significant this problem is and how we can all work together," explained Shaver.

In September of 2006, EPA issued new, tougher standards for PM NAAQS (National Ambient Air Quality Standards). The PM standards are being implemented over a several year span as each state sets forth their individual requirements. The ozone standards revisions are due in March of 2008.

A number of other initiatives that involve agriculture center around clean water, superfund (CERCLA-EPCRA), Spill Prevention Control and Containment measures (SPCC), and Concentrated Animal Feeding Operations (CAFOS).

"In all of these areas EPA is working with agricultural interests to provide positive options, focusing on results that are both effective and economical, and that require patience and communication," according to Ms. Shaver. She invites anyone with questions or comments to contact her at *shaver.sally@epa.gov*. ●

Clifford Discusses (cont'd from page 1)

Approximately 1,300 veterinarians and technicians are on standby to help, supplementing the efforts of thousands of Veterinary Services employees at the federal and state level.

"APHIS is pursuing plans to deal with outbreaks of both low-pathogenic and high-pathogenic avian influenza," Clifford said, "and is continually revising and updating its high-path response plan with input from industry and state-level agencies."

"A very critical component of this is making sure that it interrelates well and provides synergy with the states' plans, since the way we implement a command system structure or response is at the local level, then to the state, and then to the national level, so we heavily rely upon good quality state plans," Clifford said.

"Overall, here in the United States, we feel that we have a very robust system. That doesn't mean that we don't have gaps to fill," he added. "There's always room for improvement, but I think we're in very good shape with regard to our surveillance system."

"Reasons for this status include good relations with industry, a policy of indemnity payments to encourage reporting of avian influenza and the expertise of top avian influenza researchers. The key to combating avian influenza is early detection and rapid response, and APHIS maintains a comprehensive emergency response structure in partnership with the states and industry," Dr. Clifford said. Planning also occurs in collaboration with federal partners such as the Departments of the Interior, Health and Human Services, and Homeland Security.

Surveillance is an important part of the effort to prevent avian influenza outbreaks and one with multiple data streams. In the United States, commercial poultry and breeder flocks, production flocks, live bird marketing systems, and wild birds are all included in surveillance, as are backyard poultry, swap meets, and upland game birds raised for release. A national surveillance plan has been under review and should be released for comment soon.

"The live bird marketing system is of particular concern. Standards for this system were published in 2004 and are implemented through the states with federal oversight. The standards are designed to prevent circulation of low-pathogenic avian influenza in the live bird marketing system and prevent it from being introduced into the commercial poultry sector," Clifford said.

"Live bird marketing is a complex system that requires diligence on the part of the federal and state governments," he added, "and APHIS is continuing to strengthen its efforts and seek additional funding for ongoing surveillance and testing. To date, the program has been successful, with a significant reduction in positive samples."

APHIS also has an ongoing wildlife surveillance program conducted in cooperation with various other agencies and departments.

In addition, the department is involved in international efforts to combat the spread of avian influenza. These include providing personnel, resources, and funding to the crisis management center at the United Nations Food and Agriculture Organization.

"We believe that the best strategy is to try to reduce or eliminate the virus on an international scale to reduce the chance of domestic spread," Dr. Clifford said. He noted that the United States has provided response teams, equipment and expertise abroad to help address outbreaks and will continue to do so. Another thrust is to help other countries build the infrastructure to respond to avian influenza; without this base, the international spread of disease is more likely to occur. ●

1918 Flu Virus (cont'd from page 2)

of death through early intervention.

The mechanisms that contribute to the lethality of the virus were uncovered by University of Washington researchers analyzing gene functions and interactions. Dr. Michael G. Katze, professor of microbiology at the University of Washington, noted that this portion of the study, combined with earlier research showing the host response in mice infected with the 1918 flu, suggests that "the host immune response is out of control in animals infected with the virus."

The same excessive immune reaction has been shown to be characteristic of the deadly complications of H5N1 avian influenza.

"What we see with the 1918 virus in infected monkeys is also what we see with H5N1 viruses," Dr. Kawaoka states, suggesting that the ability modulate immune response may be a shared feature of the most virulent influenza viruses.

Upon infection, the virus grew rapidly in the infected animals, suggesting that the agent somehow sets the stage for virulent infection.

"Somehow, early in infection, this virus does something to the host that allows it to grow really well," Dr. Kawaoka said, "but we don't know what that is."

Nevertheless, knowing that the virus does something early in infection to trigger such a devastating immune response has scientists taking on another goal: To learn how to intervene and stop or mitigate the virus' potentially lethal effects.

To learn more about this work, go to *www.nature.com/nature/journal/v445/n7125/pdf/nature05495.pdf* where you can view the complete document in the Jan. 18, 2007 issue of Nature, Vol. 445. ●

Optimum Body Temp Can Lessen Dehydration of Day-Old Chicks

Whether in the hatcher, in the storage room or during prolonged transportation, increasing relative humidity of day-old chicks may not be the solution to reducing the risk of dehydration. Dr. Ron Meijerhof, senior technical specialist for Hybro B.V. contends that maintaining optimum body temperature for a day-old chick at approximately 104° to 105° may be the answer to preventing them from quickly becoming dehydrated.

"The chick is comfortable at this temperature," Dr. Meijerhof relates. "It will move around and explore and find feed and water. However, if the chick's body temperature fluctuates below or above this optimum, the bird will feel uncomfortable and become lethargic."

"While older birds can use energy from feeding to produce body heat when they are too cold, day-old chicks can only huddle together to prevent heat loss, which prevents them from feeding or finding water."

Dr. Meijerhof explains that day-old chicks first spread their wings to control their temperature when they get too warm. When that does not provide the desired results, the chicks start to evaporate water by panting to increase their heat loss. Day-old chicks that have the correct body temperature breathe through their nostrils, losing moisture at around 1g to 2g per 24 hours.

"When the chick's body temperature climbs above 41°C (106° F), it will start to pant," Dr. Meijerhof states. "This panting activity will rapidly increase moisture loss, and, in extreme situations, a chick may lose up to 5g—and sometimes as much as 10g—per 24 hours."

"If we increase relative humidity in the chicks' environment, we prevent that moisture loss—and with it dehydration. But we also prevent the bird from cooling itself in an overheated situation. If the bird is comfortable and breathing through its nostrils, relative humidity will have only a limited influence on its moisture loss."

Dr. Meijerhof recommends five measures to help prevent dehydration of day-old chicks:

1. Control body temperature and prevent the chicks from panting. If the bird eats, including its uptake of the yolk, the digestion of feed and yolk will result in the formation of metabolic water. This metabolic water is enough to compensate for any moisture loss at optimal body temperature. While the chick may lose some weight, this will not result in dehydration.
2. Give a small quantity of feed, even in dry form, during transportation. This measure will help the bird to metabolize the yolk, therefore producing metabolic water. Again this measure only works when body temperature is optimal.
3. Provide additional water if providing feed that contains a large quantity of water. This, too, stimulates yolk uptake and the production of metabolic water. And again, this measure is only sufficient when body temperature is correct.
4. Have water available and "findable" after the chicks arrive at the farm as they need to restore any excessive water loss. Remember that birds that have been seriously overheated during transportation will have limited ability to find water.

Poultry Inspection Changes on Tap

Poultry plant inspection is set to change. Federal inspection at plants where the danger from *E. coli* and other pathogens is high or where past visits have found unsafe practices will increase. New policy will also result in fewer inspections at plants with lower risks and better records for handling poultry.

"We're just putting resources where the risk is greatest, and those plants that demonstrate excellent control will get less of our resources," said Dr. Richard Raymond, USDA Undersecretary for Food Safety.

The same inspection system will apply to meat plants. And, for now, the new system will be used in processing plants, not in slaughter plants. No timetable has been set for shifting to the new inspection system. Dr. Raymond explains that the new system will be rolled out in incremental pieces and must start with educating and training the work force.

Each processing plant's level of scrutiny will be determined by a "risk-based" system that considers the type of product and a plant's record of food safety violations. For example, a plant that makes chicken wings and has repeated violations would get more inspections. On the other hand, a plant that makes cooked turkey burgers and has a clean track record would get less scrutiny.

In an interview with Associated Press, Raymond noted that certain food products carry a higher inherent risk than others, and processing plants differ on their ability to control risk. Although illnesses from *E. coli* among all food are down 29 percent from a decade ago, rates increased from 2004 to 2005. Dr. Raymond says the numbers are not low enough.

The new risk-based inspection system is the first major change since the department overhauled inspections in 1996 after hundreds of people became sick and four children died after eating undercooked hamburgers from Jack-in-the-Box restaurants.

Currently, the USDA has 7,500 food safety inspectors conducting about 9.2 million inspections at about 6,000 meat and poultry plants each year. About 90,000 microbiological samples are gathered and tested annually.

Flock Health, Good Bird Performance Linked to Water Supply

Harmful pathogens such as *E. coli*, *Pseudomonas* and even *Salmonella* are known to lurk in drinker lines and be a continuous source of contamination. Likewise, yeasts and molds that thrive in low pH water can produce a gooey slime that clog drinkers and restrict the amount of water actually getting to the birds.

"Providing a clean, safe and sanitized water supply is crucial in assuring flock health and that flocks perform their best," states Dr. Susan Watkins, extension poultry specialist, Center of Excellence for Poultry Science, University of Arkansas.

Before implementing a daily water sanitation program, Dr. Watkins recommends thoroughly cleaning as much of the water distribution system as possible. She says line cleaning is a necessary step because even low levels of sanitizer placed in dirty water lines can result in biofilm sloughing off—and this can clog drinkers and restrict water to the birds.

Dr. Watkins also points out that sanitizers added to the drinking water can react with biofilms in the water lines and produce off tastes that birds find offensive. As a result, water consumption is decreased and performance can be hurt.

"Many disease-causing organisms like *Salmonella* can live for weeks in water line biofilm resulting in a continuous source of contamination," Dr. Watkins explains. She adds that proper line cleaning can help prevent calcium deposits or scale build-up which can reduce pipe volume by as much as 70-to-80 percent.

"Yet the use of cleaning products present some dangers since many of the popular water additive products such as acids and performance enhancers can create conditions favorable for the growth of yeasts and molds, if they are present," she relates.

Dr. Watkins explains that yeasts and molds can actually thrive in low pH water, resulting in a gooey slime that will clog drinkers and generally "create disaster in water systems."

This poultry extension specialist strongly urges producers to properly clean water systems between flocks.

Concentrate on 4 Areas

Four areas should be considered to ensure lines are effectively cleaned: water source, mineral content of the water supply, products that have been used in the water system and recurring health products on the farm.

"Untreated well water—water that is not treated with any type of daily sanitizer product—is the most vulnerable to the formation of slime or biofilm in the drinker lines," she states. "While most municipal or rural water supplies contain a minimum of 0.2 ppm free chlorine which greatly reduces bacteria growth, poultry drinking water is handled differently—slow flow and warmed during brooding—from the water supply that goes to a home."

"Thus, it is unwise to assume that cleaning of drinker lines is not needed."

Two sources of scale—a hard white build-up—are calcium and magnesium. If the water supply contains more than 60 ppm of either or both of these minerals and the water pH is above 7, then scale in the water systems is most likely present and will need to be removed with an acid cleaner designed for nipple drinker systems.

Other common mineral contaminants include iron, manganese and sulfur. Iron results in a rusty, brown to red residue while manganese and sulfur form black residues.

If the water smells similar to a match head or more like rotten eggs, then the likely culprits are sulfur or a sulfur-loving bacteria hydrogen sulfide, respectively. In either case, Dr. Watkins advises the lines be cleaned with a strong sanitizer.

"It might even be necessary to shock chlorinate the well," she states. "If the filters at the beginning of the water lines are rusty or black, then a strong acid cleaner should follow the sanitizer flush."

Biofilm may be present in water lines if additives such as vitamins, electrolytes, sugar-based products, mineral-based performance enhancers or weak concentrations of water acidifiers have been used frequently. "Once a biofilm is established in a water system," Dr. Watkins says "the system is usually 10 times to 1,000 times harder to clean."

"It is important to play it safe and use strong sanitizer cleaners," she interjects.

Health issues such as *E. coli*, necrotic enteritis or respiratory challenges that occur flock after flock may be a sign that the organisms causing the challenges may be hiding and thriving in the water supply, particularly in water regulators and drinker lines. A helpful solution: cleaning with a strong sanitizer.

Selecting a Product

"After identifying the type of cleaning that will be most beneficial," Dr. Watkins says, "the next step is to choose a product that will not damage the equipment. Several acid products are available for scale removal."

"Just remember that in order for the product to be effective in removing scale, it needs to drop the water pH below 6," she states.

The poultry extension specialist cautions against using a strong bleach solution. While this solution might be effective in removing biofilm, it can damage regulators and nipple drinkers. She says the same is true for many cleaners that might otherwise be good poultry barn disinfectants, adding that iodine is not a wise choice.

Dr. Watkins points out that several sanitizer products are available for cleaning drinker systems with the concentrated, stabilized hydrogen peroxides getting her nod.

"The active ingredients in these products are different from over-the-counter hydrogen peroxide because the stabilizer keeps the sanitizer from converting to water and oxygen before

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Pre-Pandemic Influenza Vaccine in Europe

A new generation H5N1 split antigen pre-pandemic influenza vaccine manufactured by GlaxoSmith-Kline has been accepted for review by the Committee for Medicinal Products for Human Use in Europe. The new vaccine uses a proprietary adjuvant system technology that allows a low amount of antigen to elicit a strong seroprotective response—the so-called "antigen-sparing" effect.

USPEA Elects Officers

Henry Welch of Mississippi was elected chairman of the U.S. Poultry & Egg Association board of directors during the association's annual meeting in early February. Other individuals elected to offices include Bill Bradley, Arkansas, vice chairman; Steve Willardsen, Kansas, secretary; and Monty Henderson, Arkansas, treasurer.

USPEA board members include James Adams, Dolph Baker, James Brock, Lyman Campbell, High Cholick, Gary Cooper, Shawn Crider, Jay Daniels, Jay Houchin, Donnie King, Richard King, Jacques Klempf, Elton Maddox, Roger Marino, Dr. Don McIntyre, Dr. Ron Prestage, Mike Roberts, Wendell Shelton, Keith Shoemaker, Maker Waller, Henry Welch and Terry Wright.

American Poultry Hall of Fame Inductees

Five individuals were inducted in January into the American Poultry Hall of Fame: Don Bell, Nelson Cox, James Denton, Robert Harms and Richard Witter. The American Poultry Historical Society bestows this honor to a maximum of five individuals at three-year intervals.

Bell, an extension advisor and specialist at the University of California from 1958 to 1999, is known internationally for his applied research related to cage-layer management and egg marketing. Cox, a USDA/ARS employee for 35-plus years, has devoted his professional life to research related to reducing food-borne pathogens such as *Salmonella* and *Campylobacter*. Denton has worked in poultry and food safety for 36 years and serves as the Secretariat for the National Alliance for Food Safety and Security. Harms developed the daily feeding concept for laying hens and modified this concept to calculate nutrient requirements based on unit of product produced. He has worked extensively on amino acid, vitamin and mineral requirements. Witter developed, in part or in whole, five of the seven currently licensed Marek's disease vaccines. He discovered "protective synergism." The mixing two or three Marek's disease vaccines together is more effective than the individual components.

NIAA Selects Vise-Brown as New CEO; Reorganizes and Makes Other Staff Changes

Michele Vise-Brown

Michele Vise-Brown was appointed Chief Executive Officer (CEO) of the association by the NIAA Board of Directors effective January 1, 2007.

In making the announcement, NIAA Board Chair Scott Stuart said, "We believe we've selected the ideal person to head NIAA. Michele Vise-Brown has been with NIAA since 2003 serving as Director of Member Relations and Committee Operations; she has done an outstanding job for us. Of particular note is the leadership she has provided this year in the absence of a full-time CEO. Nowhere was that more evident than with ID/INFO EXPO 2006 in Kansas City last August. She and the staff made the 2006 event the most successful in history."

Stuart went on to say that he and the rest of the Board of Directors believe that because Vise-Brown knows NIAA so well, her selection as CEO assures a virtually seamless transition and eliminates any need to relocate the office.

Vise-Brown replaced Dr. Nevil Speer who had been the acting CEO since June. "The association owes Dr. Speer a huge debt of gratitude for his leadership for the past six months," said Stuart. "I'm sure it has been a burden to him as he has many responsibilities at the Department of Animal Science at Western Kentucky University."

"He's been a joy and inspiration for me and the rest of the staff to work with," added Vise-Brown. "We've all learned a lot and grown under his direction and I know I'll be relying on him for help as I start this new challenge."

In other staff changes

Pamela Meador, formerly NIAA's part-time accountant, has joined the staff full time and is responsible for accounting and operational functions.

"Her understanding of NIAA, financial support, agriculture knowledge and exceptional customer service is much welcomed to NIAA staff and members" said Vise-Brown.

Gale Johnson is serving as NIAA's Director of Communications on a contract basis. "Gale has worked with NIAA on numerous projects over the years including the Eradicate Scrapie! outreach program, last year's ID/INFO EXPO and a number of other projects. He is a

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huge asset because of his familiarity with NIAA and his very extensive background in all phases of agricultural communications," stated Vise-Brown.

Two Western Kentucky University students, senior **Cora Newsom** and junior **Jenna Brown** are working as staff assistants. Newsom, who joined NIAA last summer, is majoring in Economics with minors in Agriculture, Finance, and Business Administration. Brown joined the staff at the beginning of this year and is studying Agriculture Business with an emphasis in Agriculture Communications. Both women have extensive personal animal agriculture backgrounds raising and showing livestock, 4-H, and activities at the University.

Kelly Gill is a graphic designer under contract. She is a past employee of The Liberty Group, NIAA's printing house. She is on call to design promotional material or complete layout for NIAA publications.

Julie Jones is now a Registered Nurse and is working full time at the Vanderbilt University Burn Unit, but she is still involved with NIAA. She is maintaining the NIAA, Scrapie and Johnes websites and helps train her replacements on her day off.

Nevil Speer, even though he has taken on more duties at Western Kentucky University, has agreed to help NIAA as needed.

Ken Olson will continue to work on the Johne's Education Initiative. Launched in the summer of 2005, the program is a collaborative effort between industry and government to educate producers, veterinarians and others involved in beef and dairy production about Johne's disease.

Peggy Logsdon resigned from NIAA effective December 31, 2006.

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it finishes the cleaning job," she notes. "There are also several chlorine dioxide products available, but they are most effective if an acidifier is present which may require dual injectors or a way to safely mix the products prior to injection."

While household ammonia is a third option, a test on algae shows an ounce of ammonia in a gallon of water is not nearly as effective as a three percent ammonia solution. Dr. Watkins cautions, however, that the equipment manufacturer should be consulted before using this.

"The most important fact to remember is biofilms or established growth of bacteria, molds and fungus in water systems can only be removed with cleaners that contain sanitizers," she states. "It also should be a product and concentration that will not damage the equipment. Pay close attention to any product safety recommendations and follow them accordingly."

Clean, Then Keep the System Clean

Step one to cleaning the water lines is to flush the lines with high-pressure water to remove any lose sediment from the lines. Also check that the standpipes are working properly so air build-up occurring during the cleaning process will be released from the lines.

Next determine how the cleaner will be injected and clean away. A broom can be used to sweep the nipple drinkers to get the cleaning product down into the drinkers.

"Once the drinker lines are filled with the cleaning solution, let it stand as long as possible with 72 hours being ideal," Dr. Watkins elaborates. "Check with the product manufacturer, however, to assure this will not damage the equipment."

After the lines are cleaned, re-cleaning the lines with an acid cleaner is recommended if mineral build-up is an issue.

Dr. Watkins stresses that cleaning the water lines between flocks is only half the battle.

"Even with a thorough cleaning, if a significant number of bacteria, fungi or yeasts are present, then the biofilm has the potential to return completely in two to three days," she tells. "Therefore, the last step is to establish a daily water sanitation program."

"This will benefit both the birds and the water system."

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