

California Poultry Letter

University of California•Cooperative Extension

March/April 2001

Transportation Meeting

On March 17, 2001, the California Poultry Federation hosted a meeting on poultry transportation. Seventy people attended the meeting with representatives from all major poultry commodities.

Dr. Richard Breitmeyer, California State Veterinarian, spoke to the importance of transportation issues for the poultry industry. He remarked that self-regulation of poultry transportation is an important step to preserving markets for poultry products and freedom from regulation. If self-regulation does not occur and result in substantial improvements in poultry transportation, the industry can expect that there will be governmental regulation.

Dr. Pam Hullinger from the California Department of Food and Agriculture, showed a film clip from a Reno TV station on the escape and death of chickens during transport. Dr. Hullinger noted that this is what consumers are seeing and they want the poultry industry to solve these issues. Dr. Hullinger further pointed out that the consumer doesn't differentiate between companies when assigning blame but recognizes only that a "chicken is a chicken." Solutions that address consumer concerns should include all poultry transportation. She indicated that guidelines for poultry transport have been adopted in Canada and in Europe, which may be a starting point for the development of guidelines that specifically address California poultry industry and consumer concerns.

Dr. Carol Cardona spoke on the importance of good transportation practices in ensuring that a safe and wholesome product reaches the processing plant or that a healthy chicken reaches the farm. Her presentation focused on the breakdown of natural protective barriers, which

occurs during times of excessive stress including transportation. In order to assure long-term progress in solving transportation problems, new systems may need to be developed but in the short term, everyone involved can make sure that the system in place is working. Abuses come from ignorance and carelessness. **Attention to detail and appropriate employee training is critically important in the transportation of poultry.**

Reports from the California Poultry Health Symposium and Western Poultry Disease Conference

(summarized by Drs. Carol Cardona and Joan Jeffrey)

Salmonella enteritidis and Molting

Dr. Peter Holt from the Southeast Poultry Research Laboratory presented a summary of his work on *Salmonella enteritidis* (SE) in molting and molted egg laying hens. Dr. Holt presented data clearly demonstrating that hens can be more easily colonized by SE during or immediately after a fast-induced molt. A non-molting hen must be given 10,000 SE organisms before she can be colonized compared to a molting or recently molted hen that can be colonized by as few as 10 organisms. Dr. Holt stressed that in an environment free of SE, molting will not create an SE problem. Programs like the California Egg Quality Assurance Program (CEQAP) promote environmental monitoring for SE to prevent exposure of hens, especially during high-risk periods such as during or immediately following a fast-induced molt. Dr. Holt recommended that effective biosecurity measures be maintained during flock molting.

Dr. Holt has compared the SE sensitivity of hens induced to molt by various methods. Several molt diets which lack the energy and nutrients

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necessary to maintain egg production have been compared to fasting as a molting method. The use of molting diets in place of fasting reduced the hens' susceptibility to SE colonization when compared to SE challenged hens molted by fasting. These results strongly suggest it is fasting that affects a hen's susceptibility to SE colonization and not molting.

Dr. Holt's work has been widely quoted and, he says, misquoted. Dr. Holt says that although his work demonstrates an association between molting and SE in the laboratory, there are several reasons why it should not be translated directly to the hen house. First, the association was made in a strain of chickens that is not used commercially. Second, the way that hens are exposed to SE from the environment may influence their susceptibility. Dr. Holt's work does not attempt to mimic natural exposure. Third, hens in a commercial production unit will be exposed to other bacteria that can alter their susceptibility to SE colonization. The laboratory setting cannot adequately mimic commercial settings. There are many questions that need to be answered about the association of molting and SE. But, in the meantime, quality assurance procedures can help to keep the layer environment free of SE, making this potential association irrelevant.

Avian Influenza and Newcastle Disease in Italy - From Bad to Worse

Drs. Ilaria Capua and Franco Mutinelli recounted recent experiences in Northern Italy with avian influenza and Newcastle disease. In March 1999, avian influenza appeared in and eventually spread to 199 poultry flocks. This virus was typed as H7N1 but was of low pathogenicity. So, although the virus was related to the highly pathogenic types, it did not cause high mortality. In Europe, there are no regulations to control low pathogenic avian influenza viruses that are closely related to the highly pathogenic strains. **[As an aside, all H7 and H5 virus types are regulated in the United States. An outbreak in the US would be stamped out even if the virus did not cause heavy mortality.]** In the Italian outbreak, within 6 months the virus spontaneously mutated into a highly pathogenic virus causing up to 100%

mortality in infected flocks. More than 14 million turkeys, chickens, ostriches, pheasants, ducks, and quail were slaughtered in order to eradicate it.

This eradication effort decimated the Italian poultry industry but not consumer demand. In order to meet demand, and to refill Italian poultry houses, hatching eggs were imported from all over Europe. Eggs came from flocks with varying vaccination histories, and, as it turned out, contained different infectious agents. Quarantine controls were relaxed due to urgent demand and within 6 months, exotic Newcastle disease was found in several flocks and it had to be eradicated.

During this crisis, many poultry producers had gone bankrupt or were on the verge of losing their life savings. Biosecurity and good management practices were abandoned as people tried anything to survive. One of the things they tried, was the use of killed avian influenza vaccines. These vaccines were illegally produced and, therefore, not regulated and their quality was not assured. The use of vaccines prevented adequate surveillance for avian influenza and eventually resulted in the re-emergence of low pathogenicity H7N1 avian influenza in August, 2000. Based on previous experience with this same virus, the decision was made to eradicate this low pathogenicity avian influenza virus.

Currently, the Italian poultry industry is free of avian influenza and Newcastle disease. However, producers have started a sanctioned vaccination program with an H7N3 inactivated influenza vaccine. The use of this vaccine limits their ability to trade in the European Union and has further disrupted their marketing system. The rebuilding of the Italian poultry industry will be a long, slow process. Our guests offered their experiences as a lesson in how *not* to handle disease outbreaks.

Newcastle Disease in Mexico - How Big is the Threat to the US Industry?

Dr. Ben Lucio from Cornell University presented information on the recent exotic Newcastle disease (eND) outbreaks in Northern Mexico. He showed truckloads of dead chickens representing

the daily mortality in infected flocks but, reminded us that although the recent outbreaks were dramatic, we should not forget that eND has been endemic in central Mexico since 1948. The long history of Newcastle disease virus (NDV) in Mexico gives us the opportunity to assess risk to the US poultry industry based on historical data.

So, what are the possible routes by which exotic Newcastle disease might enter the United States from Mexico? Dr. Lucio proposed five: Migration of workers, travel of migratory poultry advisors, seasonal migration of wild birds, movement of poultry products, and transportation of live birds. Migratory workers have often been mentioned as potential sources of NDV, although no U.S. outbreak has ever been traced to them, suggesting that they are not a good way to transmit NDV. Similarly, poultry advisors traveling between Mexico and the U.S. have never been associated with an outbreak and should be considered relatively low risk. The seasonal migration of wild birds has occurred for thousands of years and in the 50-year history of exotic NDV in central Mexico, they have never transmitted it to poultry in the U.S. As Dr. Lucio pointed out, all migratory birds can be infected with NDV but sick birds shed the most virus and sick ducks don't fly far! The movement of poultry products across the border could be an important potential source of eND to the U.S. However, currently, the flow of products is from the U.S. to Mexico and not the other way around because costs of production in Mexico are greater than in the U.S. In contrast, the movement of live pet birds has been associated with ND outbreaks in the U.S., both in 1971 in California and again in 1991 in several states. Based on historical data, the transportation of live birds should be considered very high risk for the spread of eND. Dr. Lucio advised American poultry producers that eND from Mexico is a threat to U.S. poultry primarily due to the transport of live birds across the border. Preventing workers and visitors from having contact with other birds before visiting your flock is critical in avoiding an introduction of eND.

Respiratory Diseases on the Horizon

Several speakers at the Western Poultry Disease conference (WPDC) presented papers on emerging respiratory diseases. One of the most important of these diseases is caused by **avian pneumovirus (APV)**. There are at least three subtypes of APV, types A, B and C. Types A and B are widespread in Europe but have not spread to the US. APV type C was diagnosed in Colorado in 1996 but has since been eradicated in that state. However, APV type C was also detected in Minnesota in 1996-1997 and despite all efforts, has become endemic. This virus annually costs the Minnesota turkey industry \$15 million in lost production, increased condemnations, and increased mortality when secondary bacteria invade. Speakers at the WPDC demonstrated that APV can infect sparrows, starlings, mallard ducks and rats and that they will shed the virus for up to 21 days after infection. So, once the virus enters an area, many species may serve as reservoir hosts. Information was also presented on the use of vaccines to control this disease, but, everyone would agree, the best thing is to keep APV out of the western region!

One speaker at the WPDC presented information on the emergence of a **fowlpox** virus into which another virus has been incorporated. This new virus has been associated with outbreaks of wet pox in vaccinated flocks. Currently, there is not much known about this newly recombined virus and how to protect birds once the virus is present.

Ornithobacterium rhinotracheale (ORT) is a bacteria that is already quite familiar to many California poultry producers. This agent causes fowl cholera-like disease in turkeys and chickens although it may require infection with another agent first. This agent is present in California and primarily affects turkeys causing mortality, and increased condemnations at slaughter. Speakers at the WPDC reported on the appearance of this bacterium in turkeys and broilers all over the world.

Emerging diseases are always a difficult quandary. There is usually little known about the transmission of these agents and even less known about treatment. In these cases, prevention is the best approach. **Good basic biosecurity will limit the risk of exposure of your flocks to all disease causing agents including those that are emerging.**

Infectious Bronchitis

Dr. Fred Hoerr, Professor and Director of the Alabama State diagnostic laboratory system spoke on the topic of Infectious bronchitis (IB) virus. Infectious bronchitis is a particularly difficult viral disease to control because of the ability of the virus to rapidly mutate and thus escape the immunity provided by routine vaccination programs.

Dr. Hoerr provided data from 5 years of diagnostic submissions from Alabama chickens and commented that the understanding of what was going on in the field with IB viruses has been akin to groping in the dark until the recent advances in molecular biology techniques. Dr. Hoerr showed that the major IB viruses isolated over the last 5 years are the vaccine viruses commonly used in Alabama (Mass, Conn and Ark DPI). A new variant virus GA98 appeared in 1999 and was probably introduced into Alabama from Georgia due to a lapse in biosecurity. This new virus caused a lot of condemnations in broilers at processing. Using DNA sequencing and challenge-protection studies, they were able to show that the new variant virus was somewhat related to the Delaware 072 strain and that vaccination with D-072 afforded about 40% protection against the GA 98 variant. Interestingly, vaccination by broiler companies with D-072 appeared to quickly eliminate infection by GA 98 (within months) and this virus has not been isolated since.

Dr. Hoerr pointed out 5 or 6 other variant IB virus strains that have been isolated over the last 5 years. Some of these only show up occasionally, while others seem able to really take hold in the industry. When Dr. Hoerr reviewed the data that

had been collected in the Alabama labs, on the relationship of tracheal lesions and virus strain, he was able to show that the variant viruses cause more severe lesions than the vaccine strains, but also that in some cases, even vaccine strains are causing very severe tracheal lesions. In an effort to explain this phenomenon, Dr. Hoerr also looked at data collected on organs essential to a healthy immune response in the chicken, the bursa and the thymus. This work showed that chickens that had bursa and especially thymus damage were much more likely to experience severe lesions in the trachea when infected with an IB virus. Some of the damage to the bursa is probably due to Infectious bursal disease, which is a constant presence (endemic) in Alabama. However, they were also able to show that chick anemia virus (CAV) was also present in the damaged thymus tissues. Dr. Hoerr emphasized that the CAV virus may be playing a greater role in respiratory disease infections in broiler chickens than previously realized.

Dr. Hoerr's discussion of IB strains in Alabama also included some data on laying hens, broiler breeders and game chickens. He noted that the IB strains found in game chickens were quite distinct and different than those observed in the commercial broiler flocks. Variant strains are more common in laying hens and broiler breeders, perhaps because their longer life span allows more time for virus mutation within the chicken host. Finally, Dr. Hoerr compared the ability to pick up variant strains from sick flocks by placing sentinel SPF chickens or by culturing sick broiler chickens. His data showed that virus isolations were made more often from sentinel birds (68 % of the time) versus commercial broilers (43%), but that the same strains were isolated using either technique. This means that with prompt submission of birds experiencing respiratory signs to the diagnostic lab, there is a good chance that the virus isolations over time will give a true picture of what is going on in the field. Dr. Hoerr's presentation demonstrated the multifaceted approach that is required to understand what factors are driving strain variation of IB viruses in commercial poultry flocks.

The Use of Growth Promotants Including Antibiotics in Animal Feeds

Antibiotic use in food animals is currently under attack. Dr. Cummings, Assistant Professor, Mississippi State University, presented the history of this confrontation and how it affects the food producer. Dr. Cummings first pointed out that this debate is not new, that it has circulated nearly every decade for the last 30 years. The difference today seems to be the level of "consumer hysteria" associated with the topic.

The current round of debate began with an increase in human infections in Europe with bacteria that were resistant to vancomycin. These infections were caused by a bacteria called *Enterococcus* (in particular 2 species, *Enterococcus faecalis* and *Enterococcus faecium*). These bacteria are found in the intestines of healthy people, but can sometimes cause infections in individuals who are immune-suppressed or otherwise compromised. Because these resistant bacteria are also found in the intestines of animals, Avoparcin, a feed additive antibiotic closely related to vancomycin, was banned in Europe for animal use. Interestingly, in over 30 years of using vancomycin in feed, there has been no increase in resistant infections in humans in the USA. Dr. Cummings reported there is no scientific data to support the hypothesis that feed additive antibiotics are linked to vancomycin resistant *Enterococcus*, or any antibiotic resistant bacteria in humans. Dr. Cummings went through a list of studies that can be referenced to support this stance, but said that this message seems to be lost in the hysteria. Without scientific basis Europe banned Avoparcin and it seems that the movement against use of antibiotics in food animals is gaining a lot of momentum in the American press. Dr. Cummings said that "it often appears our media creates the news, instead of reporting it."

The consequences of the European ban on feed additive antibiotics was discussed following Dr. Cummings presentation. During the discussion, a veterinarian from Austria, Dr. Franz Sommers, pointed out that the ban on feed antibiotics in

Sweden is resulting in more infections that have to be treated with therapeutic antibiotics at much higher doses and at a higher cost to the producer. This is a true back-fire situation, because now instead of preventing infections with antibiotics that are not used as therapeutic drugs, they are using more therapeutic antibiotics, those that may be of greater concern for the human population, if antibiotic resistance develops. It was also discussed that anticoccidial drugs of the ionophore class are starting to hit the radar screen in Europe, where they could be classified as antibiotics and be targeted for elimination from animal feeds. The effect of such a move on commercial poultry production, as well as other food animal industries, would be highly detrimental.

Use of Therapeutic Antibiotics: Current Issues

Dr. Joan Jeffrey, University of California, Davis, discussed issues currently surrounding the use of therapeutic antibiotics in poultry and other food animals. Therapeutic antibiotics are those that are used to treat sick animals in order to restore them to health, eliminate suffering, and to restore their value as wholesome sources of food.

Dr. Jeffrey stated that this debate has been gaining momentum over the last 20 years as scientists in the human health arena began searching to explain increased antibiotic resistance in human infections. It is also tied to the increasing concern over food safety and rise in cases of food borne illness in the USA and other developed countries. On a national level the FDA has been charged with addressing these concerns. The World Health Organization has identified *Salmonella*, *Campylobacter*, *E. coli* and *Enterococcus* as the bacteria most likely to become resistant to antibiotics. Dr. Jeffrey described the methods by which bacteria can become resistant to antibiotics and chemicals and listed the handful of antibiotics that are approved for treatment of poultry today. Of these, the flouroquinolone drugs, Enrofloxacin (Baytril) and Sarafloxacin (Saraflox) are being reviewed at the federal level for withdrawal of approval for use in poultry.

Data from Dr. Jeffrey's laboratory on antibiotic resistance of *Campylobacter* was presented. Dr. Jeffrey argued that the current regulatory climate will most certainly inhibit the development of any new therapeutic drugs for food animals and increased restriction, or worse, withdrawal of currently approved antibiotics in order to "save" them for use in humans. It was pointed out that a lot of scientific data seems to build a case for antibiotic resistance moving from animals to humans, and that sometimes these studies are reaching erroneous conclusions. Dr. Jeffrey pointed out that the judicious use of antibiotics is critical and cited the documents on judicious use of antibiotics in poultry that are available from the American Association of Avian Pathologists and other groups. Finally Dr. Jeffrey talked about the gaps in our knowledge including how management practices, like cleaning and disinfection programs affect antibiotic resistance patterns in commercial poultry. Results of this kind of work could be used to prolong the useful life of antibiotics that are currently approved and to slow the regulatory sweep against antibiotics in poultry. The discussion period brought out that it is important to keep the debate on the use of feed additive antibiotics and therapeutic antibiotics separate. And, that abuses of antibiotics by some in the industry does little to foster the confidence of the public and federal agencies in the ability of the food animal producer and veterinarian to use antibiotics judiciously.

Twins or Cousins--Paramyxovirus type 1 of Pigeons and Fowl

Dr. Joan Jeffrey, University of California, Davis presented a talk on Paramyxovirus type 1 (PMV-1) or Newcastle disease virus. Dr. Jeffrey relayed the diagnostic challenge that exists for differentiating pigeon paramyxovirus (PPMV-1) from Newcastle disease virus which is also a paramyxovirus type 1. Newcastle virus has a worldwide distribution and affects most bird species. It is a common virus of chickens and turkeys that can cause anything from mild respiratory disease to deadly infections with high mortality in 24 hours. These would be called low

pathogenic and highly pathogenic viruses, respectively.

California suffered from an outbreak of highly pathogenic NDV in 1971, which had devastating effects on the California poultry industry. Vaccination of commercial poultry against NDV is almost universal, but it cannot protect against highly pathogenic strains of the virus. Dr. Jeffrey showed that depending upon which diagnostic tests are used PPMV-1 and ND virus may appear alike. A standardized test, called the intracerebral pathogenicity index (ICPI) is one of several tests that are used to gauge the pathogenicity of paramyxoviruses. Both PPMV-1 and highly pathogenic Newcastle viruses rank greater than 0.7 on the ICPI test. Dr. Jeffrey pointed out that this could raise concerns about the protection of commercial chickens and turkeys (with the vaccination programs currently used). She quoted a study performed by J. Gelb *et al.* that tested the ability of pigeon viruses to harm chickens vaccinated with BI Hitchner and LaSota strains of NDV (the most commonly used strains for vaccination). This trial showed complete protection against the pigeon PMV-1 viruses with ICPI scores of 0.84 or above.

Dr. Jeffrey relayed that the danger of PPMV-1 to U.S. poultry producers was in affecting the ability of the industry to export products outside of the USA. Currently, rules are pending approval by the International Organization of Epizootics (O.E.I.), for determining what is considered a highly pathogenic PMV-1. The O.I.E. is a group made up of over 200 member nations, that makes international rules aimed at preventing the spread of dangerous diseases across international borders. The O.I.E. has stated that any PMV-1 virus with an ICPI of greater than 0.7 will be considered a highly pathogenic virus. Any country that identifies such a virus will be subject to export bans. Dr. Jeffrey concluded that pigeon PMV-1 and Newcastle disease virus are related, but appear to have differences in disease-causing potential for commercial poultry. The problem is, that if they are judged by the ICPI test, pigeon PMV-1's could have a negative impact on the export of all poultry products from California and the U.S.A.

Calendar - 2001

May 7-10*

Pacific Egg and Poultry Association
Annual Conference. Monterey,
California. Contact: PePa Office
916/441-0801.

June 16-19

California Poultry Federation's
Washington D.C. legislative trip.

June 19-21

Oregon/Washington Poultry Association
Conference, Wetches, Oregon.

July 11-12

American Egg Board, Chicago, Illinois.

July 14-17

American Association of Avian
Pathology, Boston, Massachusetts.

July 24-29

Poultry Science Association (combined
meeting with the Animal Science, the
Dairy Science and the Meat Science
Associations). Indianapolis, Indiana.

July 29-30

California Poultry Federation's Summer
Board of Directors Meeting. San Luis
Obispo, California.

August 4-8

35th Congress of the International
Society for Applied Ethology,
University of California, Davis.

August 14

Squab Quality Assurance Program.
Modesto, California.

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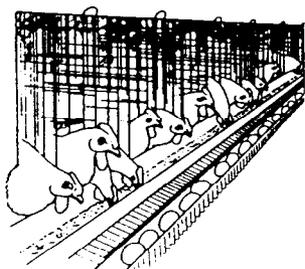
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