

CALIFORNIA POULTRY LETTER

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Are Poultry at Risk for Infection with West Nile Virus?

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West Nile virus (WNV) was first recognized in North America in 1999 in the New York City area. WNV is principally a mosquito transmitted disease of wild birds. It may also infect other animals, including horses and humans, if they are bitten by an infected mosquito. Since its arrival in the United States, this virus has moved very rapidly across the country both to the west and to the south. WNV is now present in nearly all the states that comprise the continental United States and in 2003 alone (as of October 10th) has resulted in illness to over 6,657 people, including 139 deaths (CDC, 2003).

Although many animals may become infected with WNV, most will produce too little virus to pass the virus on to feeding mosquitoes or directly to other animals. Thus, most animals are “dead end” hosts, meaning that they are not part of the WNV transmission cycle and are not important to the maintenance of the virus in nature. Humans, horses, and domestic chickens are all thought to be dead end hosts. In contrast to dead end hosts, enzootic hosts are those animals that can produce a sufficient amount of virus to infect feeding mosquitoes, thus continuing the transmission cycle and maintaining the virus in nature. There are many species of wild birds that appear to serve as the enzootic hosts of WNV in the United States.

Due to the public, veterinary, and wildlife health threat posed by WNV, many states have instituted surveillance systems to provide an early indication of the arrival of this virus as well as to identify locations within the state at greatest risk for WNV transmission. It is presumed that a rapid response to this surveillance information, in the form of increased mosquito control effort and public education, will lead to a reduction in the number of human and animal infections due to WNV. Surveillance systems include tracking human and equine infections with WNV, isolation of virus from captured mosquitoes, isolation of virus from wild birds (especially those found dead), and the use of sentinel animals (e.g. domestic chickens). Of these surveillance systems, sentinel animals provide the most precise information with respect to location and time of virus transmission and are generally the most cost effective means to monitor WNV activity.

The use of sentinel chickens for surveillance of mosquito transmitted avian encephalitic viruses (arboviruses) was pioneered by Dr. William Reeves of the University of California at Berkeley in 1943. Dr. Reeves found that chickens were ideal sentinel animals for the following reasons: 1) they are susceptible to these viruses and develop an antibody response that can be measured, 2) they produce very little virus and, therefore, would not pass virus on to feeding mosquitoes, other animals, or human handlers, and 3) their infection with an arbovirus rarely results in illness or death. Mosquito abatement districts began embracing the idea of chickens as sentinel animals as early as the 1950s. In California, sentinel chickens have been in continuous use since 1979, providing a sensitive early warning system to detect the presence of arboviruses like WNV and the related St. Louis encephalitis (SLE) virus, also found throughout the United States.

Recent studies conducted by the Centers for Disease Control have validated the use of sentinel chickens to detect WNV (Langevin, 2001). These studies showed that chickens are susceptible to infection with WNV, and that they produce too little virus to infect feeding mosquitoes. In addition, none of the chickens infected with WNV developed clinical disease and all survived the infection. These studies did show that WNV is shed by infected chickens in feces and could be detected in cloacal and oral swabs as well, but direct transmission of WNV from bird to bird was only accomplished in 1 of 16 laboratory trials indicating that direct transmission is inefficient.

So what does this all mean for the poultry producer? In a nutshell, chickens may become infected with WNV, but would not be expected to suffer clinical illness or mortality from this infection. Additionally, the presence of infected chickens would not be expected to increase the risk of WNV infection for neighboring humans or animals.



Fig. 1-2: Sentinel chicken flocks in southern California provide early warning of the presence of WNV and other mosquito transmitted avian viruses. Photos courtesy of the Coachella Valley Mosquito and Vector Control District.

REFERENCES:

CDC. 2003. Centers for Disease Control and Prevention web site: www.cdc.gov.

Langevin, S. A., M. Brunning, B. Davis, and N. Komar. 2001. Experimental infection of chickens as candidate sentinels for West Nile virus. *Emerging Infectious Diseases*. 7(4): 726-729.

Dr. Alec C. Gerry is a veterinary entomologist and extension specialist for the University of California at Riverside and a former public health biologist for the state of California.

Al Hom is a public health biologist for the state of California and is part of California's team of experts (including members of local and state agencies) that are monitoring the arrival of WNV in California.

Avian influenza in Texas

It has often been said that the only thing predictable about avian influenza is that it is unpredictable. That was certainly the case with the H5N2 virus isolated in Texas in February 2004. The first reports indicated that the clinical signs associated with the case were consistent with a low pathogenicity strain of avian influenza virus. After sequencing the virus, the National Veterinary Services Laboratory (NVSL) reported that the virus had the molecular characteristics of a high pathogenicity strain. Since the World Organization for Animal Health (OIE) requires that any virus with these molecular characteristics be reported as a highly pathogenic avian influenza virus (HPAI), this case was reported to the international community. The NVSL also performed a chicken pathogenicity test with this virus. All ten inoculated chickens remained healthy throughout the 10-day observation period. Thus, the TX/04 H5N2 avian influenza virus meets the OIE molecular criterion for classification as highly pathogenic avian influenza virus, but was not virulent for experimentally inoculated or, apparently, for birds infected in the field.

The OIE has adopted the molecular criteria for highly pathogenic avian influenza viruses because they have, in most cases, matched the outcome of the chicken pathogenicity test. However, the TX/04 H5N2 virus is not the first to deviate. Both the CK/PA/83 (H5N2) and Pekin Robin/China/94 (H7N1) viruses had the molecular characteristics of highly pathogenic viruses, but were biologically low pathogenicity. In contrast, the CK/Chile/02 (H7N3) virus lacked the molecular criteria to be highly pathogenic but was highly pathogenic when tested in chickens.

So, now that the TX/04 virus appears to be gone, thanks to the excellent work of the USDA and the Texas Animal Health Commission, we are still left wondering if the virus *would* have become a highly pathogenic strain. As most of you know, H5 and H7 viruses in chickens tend to rapidly accumulate the mutations required to become highly pathogenic strains. We also know that the other viruses, CK/PA/83 and Pekin Robin/China/94, which had the molecular characteristics of a HPAI, but were low pathogenicity in chickens, did rapidly become highly pathogenic. In fact, the CK/PA/83 became the virus that caused the Pennsylvania 83-84 avian influenza outbreak. So, despite our confusion over the classification of this virus, it's probably a very good thing that it's gone.

Carol Cardona, Extension Veterinarian, Poultry

California Avian Health Project Report

UC Cooperative Extension (Francine Bradley, Carol Cardona, Ralph Ernst and Doug Kuney) have entered into a contract with the CDFA to provide outreach on disease prevention. The goal of this project is to educate various audiences about disease prevention and biosecurity to help in prevention of future disease outbreaks. The following audiences are targeted for specific individual training.

- Game fowl (chicken) breeders
- County environmental health inspectors and egg inspectors
- Commercial squab producers
- Fairs and poultry shows
- Game bird (pheasant, quail, partridge, ducks) producers
- Commercial egg producers
- Small poultry meat producers
- Racing pigeon breeders
- Youth groups

At this time the program for game fowl breeders (**Game Fowl Health Assurance Program**) has over 202 participants. Each participant must complete three training sessions on biosecurity, swab sampling, laboratory submission and Newcastle vaccination. Participation requires regular submission of surveillance samples to the California Animal Health and Food Safety Laboratory (CAHFSL) and vaccination of birds for Newcastle. Records are kept on participation (lab submissions and vaccination reports).

Training of egg ranch and egg processing plant inspectors is proceeding quickly and most inspectors have been trained in counties with high poultry population. Biosecurity and disease prevention have been the subject of several meetings for commercial egg producers and egg processors. The California Egg Quality Assurance Program is increasing the requirements for biosecurity on production and processing facilities. This effort is cooperative with input by the program facilitator, agencies, producer members and UC Cooperative Extension. Two meetings have been held for commercial game bird producers and additional meetings are planned during 2004. Biosecurity training was part of a quality assurance training program for commercial squab producers (Ernst, Cardona). Carol Cardona also participated in a biosecurity workshop for poultry meat producers held by the California Poultry Federation.

Fairs, where poultry will be exhibited, are now required to have birds inspected at coop-in by a trained inspector. Poultry health inspector training and certification is conducted by Francine Bradley and Carol Cardona. At this time 96 people have been trained for bird inspection during the next fair season. It is encouraging that one private poultry club has also chosen to use these inspectors for coop-in bird inspection at its show.

Ralph Ernst, Extension Poultry Specialist

Bayer Loses Appeal on Baytril

Drug maker Bayer on Tuesday was cited as losing an appeal of the U.S. government's proposed ban of a poultry antibiotic that regulators partly blame for a rise in drug-resistant germs that infect people. The story notes that Bayer still has a chance to convince the Food and Drug Administration that the drug, Baytril, is an important therapy for treating sick chickens and should stay on the market. The company is contesting an FDA proposal made in 2000 to outlaw Baytril, part of a family of potent antibiotics known as fluoroquinolones that doctors consider valuable for treating food poisoning and other serious infections in people. FDA and Bayer officials were cited as saying that an FDA administrative law judge on Tuesday ruled in favor of the ban. Health officials argue that widespread use of Baytril by livestock farmers is one reason more germs are becoming resistant to other fluoroquinolones. Company spokesman Bob Walker was cited as saying that Bayer plans to appeal the judge's decision to the FDA commissioner, who has the authority to make the final decision. Walker was further cited as saying that new research shows Baytril helps provide for a healthy food supply "and we don't believe that scientific evidence was fully considered" by the administrative law judge.

California Egg Quality Assurance Plan Considers Changes to Program

Due to the recent outbreak of Exotic Newcastle Disease (END) in California last year, the egg industry has expressed interest in modifying the California Egg Quality Assurance Plan (CEQAP) to incorporate an enhanced biosecurity component. Twenty-two commercial farms became infected with END while others did not. The importance of biosecurity cannot be overstressed as a critical control point in any quality assurance plan. During the END outbreak all Southern California farms were visited numerous times by trained veterinarians to evaluate the biosecurity measures in place on farms and in processing plants. An epidemiological study was conducted to evaluate what farms did well and where they might improve biosecurity practices. Based on that study, several areas were identified to tighten biosecurity on the farm and in processing plants. After studying the report, industry leaders felt it was appropriate to modify the CEQAP program to incorporate an enhanced biosecurity program. Although the CEQAP changes are under consideration, no changes have taken place at this time. A CEQAP committee is reviewing a draft of core components that would be changed. The new proposed wording for components 11 & 19 is shown below.

11. The farm will maintain an appropriate biosecurity plan to maintain flock health. This will include:
 - a) A plan for personnel movement on the production facility
 - b) A plan to train personnel in biosecurity and document training
 - c) A plan for sanitary disposal of manure, mortality, trash and spent fowl.
 - d) A sanitation station to disinfect vehicles entering the secure area where poultry are kept.
 - e) Designated separate parking areas for employees and visitors outside the secure bird area.
 - f) A plan for visitors that includes a sign-in log, screening to assure they have not visited other poultry within 24 hours and provisions to assure clean clothing and footwear.

19. The plant will maintain an appropriate biosecurity plan to limit cross contamination of unprocessed and processed eggs.

The plan must include:

- a) A plan for visitors that includes a sign-in log, screening to assure they have not visited other poultry within 24 hours and provisions to assure clean clothing and footwear.
- b) A plan for personnel biosecurity training and documentation of that training.
- c) A plan for personnel movement and sanitation within the egg processing plant.
- d) Designated separate parking areas for employees and visitors outside any secure bird areas.
- e) New egg cartons and fiber flats should be used for all consumer packages.

Now that the END situation is under control, the California Department of Food & Agriculture (CDFA) veterinarians have initiated their farm and processing plant reviews. CDFA veterinarians will once again review a farm's Quality Assurance Plan and verify if CEQAP minimum operating and educational standards are being met. Please be assured that CDFA reviews will be based on the current CEQAP core components, not the proposed changes as indicated above. This independent, third-party review is one of the points that distinguishes the California plan from all other state and national food safety programs. Please contact David Goldenberg, CEQAP Facilitator if you have any questions regarding your CEQAP plan at (916) 933-5050 or cell (562) 221-3372 or Dr. Ralph Ernst CEQAP Education Facilitator (530) 752-3515.

Cooperative Extension Budget Reduction

Due to reductions in state tax revenue the University of California and other state supported colleges and Universities have experienced reductions in state support in '03/'04. Cooperative Extension funding was also dramatically reduced. As an example Specialist support (not salaries) was reduced by about 84% at UC Davis. Specialists are attempting to maintain programs by seeking grants, gifts, or contracts. In the poultry area, extension staff has been reduced by about twelve people since 1970. The staff will be further reduced with retirement of Ralph Ernst on 7/1/04. Programs have been reduced as positions were lost.

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Ralph Ernst, Extension Poultry Specialist

CALENDAR

April 18-21, 2004 - 3rd International Symposium on Egg Nutrition for Health, Banff Center, Banff, Alberta, Canada. For more information contact Dr. Jeong Sim, 780-492-7687; jeong.sim@ualberta.ca.

May 5-6, 2004 - California Animal Nutrition Conference, Radisson hotel and Conference Center, Fresno, CA. For additional information contact Ann Quinn (916) 441-2272.

May 10-13 - UEP Spring Legislative Meeting, Washington Court Hotel, Washington, D.C. For information contact: info@unitedegg.org.

May 17-20, 2004 - National Egg Quality School, Atlanta Hilton, Atlanta, GA. For information contact Candy Byers <cbyers@purdue.edu>.

June 8-13, 2004 – XXII World's Poultry Congress, Istanbul, Turkey. For more information contact: www.wpc2004.org.

October 24 - 26, 2004 - National Poultry Waste Management Symposium, Holiday Inn Airport, Memphis, TN. To register, please contact: Wanda Linker, National Poultry Waste Management Symposium, c/o Alabama Poultry & Egg Association, PO Box 240, Montgomery, AL 36101 Tel: (334) 265-2732 Fax: (334)265-0008, e-mail: wanda@alabamapoultry.org

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