



California Poultry Letter

March 1997

Your California Veterinary Diagnostic Laboratory System

The California Veterinary Diagnostic Laboratory System (CVDLS) was established by the California State Veterinarian, Dr. Charles Keane, in 1918 "owing to the frequent occurrence of epizootics of anthrax and allied communicable diseases of animals." The first state veterinary diagnostic laboratory opened in Sacramento. Between 1927 and 1951, five more state veterinary labs were opened throughout California. Today, there are only **five** diagnostic laboratories which are now administered by the School of Veterinary Medicine, University of California, Davis, and their mission is to provide the citizens of California with the highest quality diagnostic laboratory support service. The five laboratories and the species they work on are located in Davis (all species), Turlock (avian only), Fresno (avian only), Tulare (mammalian only) and San Bernardino (all species).

While poultry is not the only species examined in some of these laboratories, with the exception of Tulare, each houses at least one board certified poultry veterinarian who undergoes ongoing continuing education to maintain his/her skills at the highest level of any laboratory system. While not all five laboratories have the same diagnostic equipment, the system utilizes the latest technology and methods available and samples can be shipped overnight to other labs for specialty testing. For example, virus identification is performed at CVDLS-Fresno, and salmonella serotyping is performed at CVDLS-San Bernardino.

Services Available

All laboratories performing poultry diagnostics offer gross postmortem examination, bacteriology (aerobic, anaerobic, mycoplasma, and fungus cultures), serology and histopathology. A full-service virology laboratory (virus isolation and identification) is located at CVDLS-Fresno, though all poultry labs can perform the initial virus isolation procedures. Recognition of new diseases, enhancement of livestock and poultry health management, control of livestock and poultry diseases, and protection from diseases that can affect both animals and humans are vital components of the CVDLS mission and service provided to the poultry industry.

Accessing the Services of the CVDLS

There are three general ways to access the services of the CVDLS. One of the most common ways is to go through one of the Cooperative Extension Specialists or Farm Advisors. Typically what happens is the producer will contact Cooperative Extension for assistance with a field problem. The Specialist/Advisor will visit the farm and recommend that samples be taken to the nearest CVDLS laboratory. The Specialist/Advisor will then provide the necessary background information for the laboratory to fully understand the conditions in order to arrive at a quick and accurate diagnosis.

Another means of access is through the poultryman's private consulting veterinarian. Many times farm visits by **private** veterinarians result in either routine sampling for monitoring or sampling for problem diagnosis. Again, the laboratory uses the eyes of the private veterinarian in the field to provide the necessary background information for the laboratory diagnostician.

The third method of access is by direct contact by the poultryman. This usually works best by telephoning the diagnostician at the laboratory before sending samples. Before telephoning, the poultryman should be prepared to describe the symptoms, the flock, the **farm** layout and any other information that may play a role in the flock condition. The poultryman should then ask the diagnostician what and how many samples should be provided.

Relationship between the CVDLS and Cooperative Extension

The CVDLS and Cooperative Extension Specialists and Farm Advisors enjoy a close working relationship. Much information (except that which is confidential) and resources are shared between the two organizations. The CVDLS provides the diagnostic information needed by the Specialist/Advisor to help the poultryman with his/her problems, while Specialists and Farm Advisors provide the CVDLS the necessary information needed to understand the husbandry conditions under which flocks are maintained. By cooperatively working together, both **organizations** are currently providing the California poultry industry with the highest quality service.

Dr. Joan **Jeffrey**, Extension Poultry Veterinarian, is housed in the Tulare Veterinary Teaching Facility and is available to the poultry industry for consultation.

To contact individual laboratories use the following:

CVDLS-Davis
P.O. Box 1770
Davis, CA 95617-1770
(916) 752-8700

CVDLS-Fresno
2789 S. Orange Ave.
Fresno, CA 93725
(209) 498-7740

CVDLS-Turlock
1550 North Soderquist Road
P.O.Box 1522
Turlock, CA 95382
(209) 634-5837

CVDLS-San Bernardino
105 W. Central Ave.
San Bernardino, CA 92408
(909) 383-4287

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and
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SYMPOSIUM HELD ON MOLECULAR BIOLOGY TECHNIQUES FOR INVESTIGATION OF AVIAN INFECTIOUS BRONCHITIS VIRUS

Poultry and avian scientists, veterinarians, diagnosticians, UCD residents and others **gathered** at the Veterinary Medicine Teaching and Research Center in Tulare, California on February 13th for a one day symposium on applying new techniques in molecular biology to the investigation of Infectious Bronchitis Virus (**IBV**) disease in chickens. **The** program was organized by Dr. Joan Jeffrey, Department of Veterinary Extension/Population Health and Reproduction, School of Veterinary

Medicine, University of California-Davis and made possible by a grant from the Virginia Perry Wilson Endowment Fund. Dr. Ellen Collisson, Department of Veterinary Pathobiology, Texas A&M University, a world-renowned research virologist and professor in the College of Veterinary Medicine, delivered the program.

IBV is a ubiquitous, costly and frustrating disease of chickens worldwide. It causes respiratory and sometimes kidney disease, as well as drops in egg production and shell quality problems in laying hens. One of the most troublesome aspects of **IBV** is mutation of the virus, resulting in a large number of strains that look the same on blood tests for antibody, but do not offer cross protection in vaccination programs. For example, vaccination with a Massachusetts strain will not cross protect against infection with a Connecticut strain even when the chickens have a positive IBV antibody titer. Even within one virus strain, small changes in the virus genetic code frequently occur (genetic drift) making **current** vaccines less effective. Additionally, IB virus will commonly swap pieces of its genetic material with other IB viruses creating new virus strains for which we have no vaccine (genetic shifts). The recent emergence of the California variant of IBV is an example of genetic mutation in an IB virus. According to Dr. Collisson, if we look at the changes that have occurred world-wide in the IBV family tree in the last 50 years, we may conclude that **vaccine**-strain viruses are actually contributing to the evolution of recombinant virus strains.

The explosion of molecular biology in the 1980's revolutionized many fields of science, including virology. Dr. Collisson described polymerase chain reaction (**PCR**) and cloning; two key molecular techniques that have broad applications for examining the genetic material of viruses (either DNA or RNA). Cloning involves inserting a cut

piece of DNA (for example, a piece of an IBV gene) into a bacteria or virus where it is copied to high numbers by the host organism. Using **PCR**, a section of IBV gene can be cut out and duplicated, making millions of copies for study. Also, we can look at differences between virus strains such as Holland or Connecticut by cutting the viral genes at different places and comparing the pieces. Additionally, PCR technology is used to cut out strain-specific DNA fragments which are then labeled with a fluorescent or radioactive label to create DNA probes. These probes are applied to histology sections of tissue from chickens infected with IBV to detect various virus strains.

Finally, Dr. Collisson discussed how molecular techniques (**PCR** and cloning) are used to investigate the cell-mediated (**non**-antibody) immune response. An assay developed in Dr. Collisson's lab for cytotoxic T-cells (part of the cellular immune system) demonstrated that following infection with IBV, cytotoxic **T**-cells are instrumental in neutralizing viral particles and preventing disease. Stimulating this part of the immune response holds promise for the development of new types of IBV vaccines that will cross protect between **IBV** strains.

Dr. Collisson did an outstanding job of introducing and explaining these advanced molecular techniques and how to trouble-shoot problems **occurring** in your own laboratory. For those participants not performing laboratory research, Dr. Collisson's **program** provided an opportunity to become familiar with the terminology and use of molecular techniques. This understanding greatly enhances our ability to learn from subsequent scientific presentations and publications.

Joan S. Jeffrey
Extension Veterinarian

1997 Coming Events

April 15-18 - Pacific Egg and Poultry Association Annual Convention, **Hilton** Hotel, Pahn Springs. Information about registration and attendance should be directed to the **PEPA** office in Sacramento. Phone (916) 441-0801. This year's program includes educational sessions on: Salmonella enteritidis, Media and the poultry industry, Cost of egg processing, and Buyer's expectations for eggs. **This program is approved for continuing education credit for the California Egg Quality Assurance Program.**

April 19- Picnic Day, University of California, Davis.

May 14-15- California Animal Nutrition Conference, Piccadilly Inn, Fresno. For more **information** contact the California Feed and Grains Council at (916) 441-2272.

May 19-22- National Egg Quality School, Doubletree Hotel, Little Rock Arkansas. Contact Southern UEP at (770) 491-1120 for more information. **'This program is approved for continuing education credit for the California Egg Quality Assurance Program.**

May 20 - California Poultry Health Symposium, University of California Veterinary Teaching Facility, Tulare. **This program is approved for continuing education credit for the California Egg Quality Assurance Program.**

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