Poultry Health Symposium

March 27, 2001
Memorial Union (MU II)
University of California
Davis, CA

March 28, 2001
Cask n’ Cleaver
1333 University Avenue
Riverside, CA

Registration fee: $25.00. Preregistration is required.
Telephone Joanne Allen (530) 752-1524 to register.

Davis Program, MU II - March 27, 2001

8:30 a.m.  Registration

9:00 a.m.  Welcome

Respiratory Disease Session

9:05 a.m.  Avian influenza and Newcastle disease in Italy, from bad to worse?
Ilaria Capua and Franco Mutinelli, Istituto Zooprofilattico Sperimentale delle Venezie

10:00 a.m. Infectious bronchitis virus, controlling a moving target.
Fred Hoerr, Auburn University

10:25 a.m. Break

10:35 a.m. Newcastle disease in Mexico: how big is the threat to the U.S. industry?
Ben Lucio, Cornell University

11:00 a.m. Diagnosing respiratory disease: what do my results mean?
Bruce Charlton, California Animal Health and Food Safety Laboratory, Turlock

11:25 a.m. Panel discussion on international regulation of respiratory diseases.
Moderators: Carol Cardona and Joan Jeffrey

12:15 p.m. Lunch
Davis Program (continued)

**Broiler Section - MU II**

1:00 p.m.  The antibiotics in feed debate  
*Tim Cummings*

1:30 p.m.  Antibiotic resistance issues for therapeutic drugs  
*Joan Jeffrey, UC Davis*

2:00 p.m.  Closing Comments

**Layer Section - East Conference Room**

1:00 p.m.  SE and molting  
*Peter Holt, USDA-ARS*

1:40 p.m.  SE sources in the environment  
*Carol Cardona, UC Davis*

2:00 p.m.  Closing Comments

**Riverside Program - March 28, 2001**

10:30 a.m.  Registration

11:00 a.m.  Welcome

11:05 a.m.  Avian influenza and Newcastle disease in Italy, from bad to worse.  
*Ialaria Capua and Franco Mutinelli, Istituto Zooprofilattico Sperimentale delle Venezie*

12:05 p.m.  Lunch

1:00 p.m.  Newcastle disease in Mexico: how big is the threat to the U.S. industry?  
*Ben Lucio, Cornell University*

2:00 p.m.  Newcastle disease virus and pigeon paramyxovirus: twins or cousins?  
*Joan Jeffrey, U.C. Davis*

2:35 p.m.  Break

2:50 p.m.  Respiratory diseases on the horizon.  
*Carol Cardona, U.C. Davis*

3:20 p.m.  Panel discussion on international regulation of respiratory diseases.  
Moderators: Carol Cardona and Joan Jeffrey

4:00 p.m.  Closing Comments
Energy Efficient Ventilation Fans

Ventilation fans are the major electricity user in poultry houses. They can account for almost half of electricity bills in some open-type housing and use more than 80% in environmental houses. Selecting an energy efficient fan design, installing it correctly, and keeping it cleaned and well adjusted can more than halve annual electricity use.

Fan efficiency comparisons are made on the basis of airflow per unit of energy use. The most accurate comparisons are made on the basis of cubic feet per minute per watt of electricity consumption (cfm/watt). Laboratory tests of thirty-nine commercial ventilation fans measured a low of 8.3 cfm/watt to a high of 17.3 cfm/watt. The most efficient fan produced twice as much airflow compared with the least efficient.

Efficient fans cost more to purchase than less efficient designs, but electricity savings will pay back the extra cost in about two seasons of use. Efficient designs can save thousands of dollars per fan in electricity over the life of the fan. They are also well constructed and may last longer than less expensive models.

If cfm/watt data is not available then the next best efficiency index is cubic feet per minute per horsepower (cfm/hp). This number does not account for motor efficiency and it will need to be considered separately.

Fan Design

Fan blades with an air foil cross-section, use less energy than flat fan blades. The most efficient blades are usually made of cast metal rather than flat sheet metal. Efficient designs have a small distance between the tip of the blade and the fan housing. This minimizes the amount of air that can re-circulate at the blade tips. Recirculated air requires energy to move but does not contribute to airflow leaving the fan.

Slow-turning, quiet fans use less energy than high-speed fans. This generally means purchasing a larger diameter fan that is operated at a low speed. Large diameter fans can move air with less than half as much energy compared with small fans.

The small motors commonly used with ventilation fans vary greatly in their ability to convert electricity into shaft horsepower. Efficient motors use about 20% less energy than inefficient designs. Their extra cost can often be repaid in two to three seasons of lower electricity costs.

Fan Shrouds and Installation

A properly designed air inlet and outlet greatly increase fan efficiency. A sharp edged inlet reduces fan output to 80% of a properly designed shroud, Figure 1. Installing a fan without a housing reduces air output to 60%. Installing a fan backwards in a housing reduces output to less than 40% compared to a well designed unit. Exhaust side cones smooth the transition of the air as it leaves the fan and they actually increase airflow produced by the fan.

Louvers

Louvers are needed to block airflow through fans when they are not operating. Louvers on the inlet side of the fan as compared to the outlet side reduce airflow by 10% to 25%. Louvers are not needed on fans that operate continuously.
Figure 1. Effect of fan design and installation on airflow produced by a fan. Percent numbers are amount of airflow produced compared with a rounded inlet shroud.

About 1 ft² of inlet or outlet vent area is needed for each 600 cfm of fan capacity. Lower inlet areas restrict flow. Air leaks should be sealed to maintain designed airflow patterns in the house. Leaks may cause both hot and cold spots in the house.

Maintenance

Louvers should be cleaned regularly to maintain airflow. A one-eighth inch layer of dirt on a louver can reduce airflow by 30%. Louvers need to be checked to ensure they open and close freely. Use graphite or some other lubricant that does not foster dirt build-up on the louvers. Dirt on fan blades does not have a large effect on airflow or fan efficiency.

Belts should be tightened and pulleys replaced when they are worn. Poor belt and pulley maintenance slows the speed of the fan and reduces the amount of air it produces.

Rebate Programs

Selection of efficient fans usually increases their cost but is a good investment. Utility companies often offer rebates to encourage their customers to use efficient equipment. In some cases these rebates will cover all of the extra cost of an efficient fan. Check with your local company and make plans for installing new fans before the summer season begins.

Jim Thompson
Agricultural Engineering Specialist
Tests for DNA

Biotechnology is exploding in the fields of disease diagnosis, genetic selection, environmental testing, and food safety. DNA-based tests are the most common of these new powerful tools and they open new possibilities for scientific discovery but only if used, performed, and interpreted correctly.

PCR

PCR or polymerase chain reaction is probably the most widely known and used of all biotechnology tests. PCR detects DNA, the genetic material found in almost all living organisms. A single piece of DNA (from a single organism) is reproduced approximately 1 million times with PCR making tiny quantities of DNA detectable. The PCR technique does not allow us to quantitate how many organisms were present in the original sample. Therefore, one of the limitations of this technique is that it cannot tell us if a particular sample contained a sufficient quantity of an organism to cause disease or be a food safety concern. The value of this test however, is that it is extremely sensitive in detecting the presence of an organism.

DNA Sequencing

Determining the sequence of the genetic material of an organism is sometimes very helpful in determining the virulence of the organism, or where it came from. By comparing the sequence of the DNA base pairs of two or more organisms (review "How DNA, RNA, and Proteins Work: A Primer to Biotechnology" in the September-October 2000 issue of the California Poultry Letter), DNA sequencing allows us to determine how closely related those organisms are. Obviously, for this technique to be useful, the sequences have to be worked out for the sections of DNA which are of interest. It follows that the more we know about the DNA sequence of an organism, the more powerful and useful this technique is. For example, a specific sequence in avian influenza virus that determines its ability to cause severe disease has been worked out, which allows sequencing of field isolates to determine if they contain the same sequences in order to predict their virulence. In contrast, infectious bronchitis virus sequences may help determine where the virus came from but may not be related to vaccine protection, the answer everyone wants to know.

Other tests

Restriction fragment length polymorphism (RFLP) is very useful in differentiating organisms with relatively large genomes like strains of bacteria or humans. The test works by exploiting enzymes that recognize differences in DNA sequence and comparing their interactions with the DNA from different organisms.

Southern blotting and dot or slot blotting are techniques that take advantage of the double stranded nature of DNA. In these techniques, unknown DNA is immobilized on a membrane and one strand is removed. A single strand of DNA with a known sequence called a probe is labeled with a dye. The probe is added to the membrane and if the two pieces of single-stranded DNA are complementary matches, then they will connect and the spot of DNA on the membrane will turn color.

Biotechnology is a new science with great promise. As more is known about the relationship between DNA and disease, DNA-based tests will become more useful and more widely applied. As with any test, useful results are only those that are relevant to what is happening in the birds and, in many cases, that information is not available.

Dr. Carol Cardona
Poultry Extension
Veterinarian
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**Calendar - 2001**

**March 23**
American College of Poultry
Veterinarians Nutrition Workshop -
"Nutritional Challenges for the 21st
Century". UC Davis.

**March 24-26**
Western Poultry Disease Conference.
(50th Anniversary) UC Davis.

**March 27**
UC Poultry Health Symposium. UC
Davis. Contact: Joanne Allen 530/752-
1524.

**March 28**
UC Poultry Health Symposium,
Riverside. Contact: Joanne Allen
530/752-1524.

**April 5-7**
National Chicken Cooking Contest.
Sacramento.

**April 25-28**
ANECA Poultry Disease Conference.
Acapulco, Mexico.

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**May 7-10**
Pacific Egg and Poultry Association
Annual Conference. Monterey.
Contact: PePa Office 916/441-0801.

*Approved for CEQAP Credit*

Visit our website at:
http://animalscience.ucdavis.edu/extension/avian

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