

# California Poultry Letter

University of California • Cooperative Extension

January-February 2001

## 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

The University of California Cooperative Extension, in compliance with the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and the Rehabilitation Act of 1973, does not discriminate on the basis of race, creed, religion, color, national origin, sex, or mental or physical handicap in any of its programs or activities, or with respect to any of its employment policies, practices or procedures. The University of California does not discriminate on the basis of age, ancestry, sexual orientation, marital status, citizenship, medical condition (as defined in section 12926 of the California Government code), nor because individuals are disabled or Vietnam era veterans. Inquiries regarding this policy may be directed to the Director, Office of Affirmative Action, Division of Agriculture and Natural Resources, 300 Lakeside Drive, Oakland, California 94612-3550. (510) 987-0097.

University of California and the United States Department of Agriculture cooperating

## **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.  
*Ilaria Capua and Franco Mutinelli, Istituto Zooprofilattico Sperimentale delle  
Venzie*
- 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 recirculate 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.

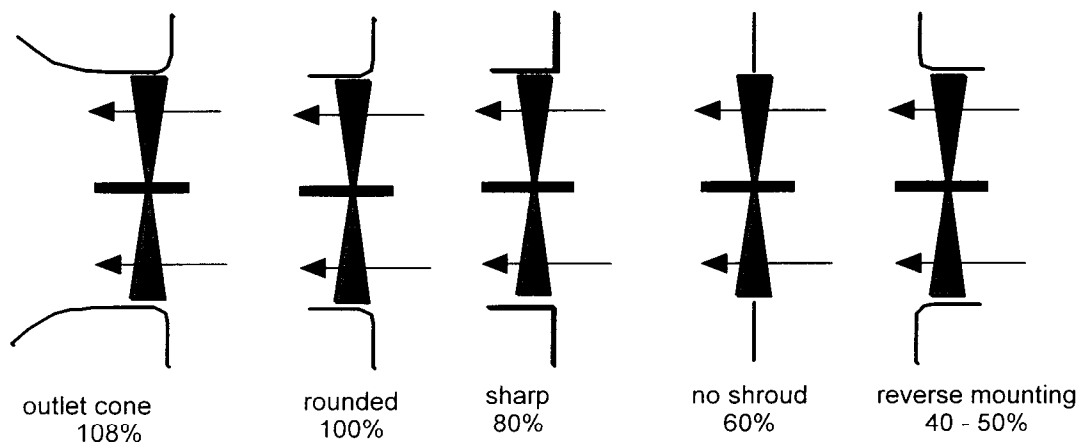


Figure 1. Effect of fan design and installation on airflow produced by a fan. Percent numbers are amount of airflow produced compared with a rounded inlet shroud.

About 1 ft<sup>2</sup> 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***

**CALIFORNIA POULTRY LETTER INDEX**

**January - December 2000**

	<b><u>MONTH</u></b>	<b><u>PAGE</u></b>
<b>A. <u>DISEASE</u></b>		
Avian Influenza Attacks Northern Italy	Mar/Apr	3
Relationships of Paramyxovirus and Infectious Newcastle Disease	May/Jun	4
Diagnostic Laboratory Notes	May/Jun	6
Bio-security Was Never More Important	May/Jun	6
Immunosuppressive Viruses-Setting Your Birds up for Disease	Jul/Aug	1
The National Animal Health Reporting System	Sep/Oct	4
<b>B. <u>ECONOMICS</u></b>		
One Degree (F) May Not Seem Like Much, But It Can Represent A Lot of Money	Nov/Dec	1
<b>C. <u>INCUBATION AND HATCHING</u></b>		
Hatchability Problems	May/Jun	2
Incubation Research	May/Jun	3
Egg Defects and Hatchability	Jul/Aug	3
<b>D. <u>MANAGEMENT</u></b>		
One Degree (F) May Not Seem Like Much, But It Can Represent A Lot of Money	Nov/Dec	1
Do Strains Perform Differently Under Various Space Allowances?	Nov/Dec	2
Ammonia-Its Effect on Poultry	Nov/Dec	4
<b>E. <u>MISCELLANEOUS</u></b>		
Electronic Communication and Information		
Retrieval in Today's Poultry Industry	Jan/Feb	1
Donald V. Zander 1916-1999	Jan/Feb	8
Recovering from Terrorist Acts	Mar/Apr	1
4-H Poultry Alumnae Capture Scholarships and Awards at Pacific Egg and Poultry Association (PePa) Convention	Mar/Apr	3
San Diego Siting	Mar/Apr	3
Emu Producers Mount New Promotional Efforts	Mar/Apr	4
How DNA, RNA, and Proteins Work: A Primer to Biotechnology	Sep/Oct	3
California Picks its First Egg Preparation Champion	Sep/Oct	7
South African Poultry Association's Poultry Welfare Standards	Nov/Dec	7
<b>F. <u>MOLTING</u></b>		
AB 2141-Molting Ban	Mar/Apr	2
Molting Bill Defeated in Committee	May/Jun	5
Molting Methods Compared	Nov/Dec	2
<b>G. <u>PRODUCTS</u></b>		
Designer Egg Concept: Nutritional and Functional Significance	Sep/Oct	2
"Free Farmed" Program Announced	Sep/Oct	6

<b>H. <u>QUALITY ASSURANCE</u></b>		
Food Service Company Takes Proactive Measures	Mar/Apr	2
Food Safety	Mar/Apr	3
Egg Safety Hearings	May/Jun	5
Food and Drug Administration "Current Thinking" Document For On-Farm, Packer/Processor, and Retail Standards for Reducing <i>Salmonella Enteritidis</i> in Shell Eggs	Jul/Aug	4
FDA Finalizes Safe Handling Labels and Refrigeration Requirements for Marketing Shell Eggs	Nov/Dec	1
<i>Salmonella Enteritidis</i> in Table Egg Layers in the U.S.- The Layers '99 NAHMS Report	Nov/Dec	6
<b>I. <u>WASTE</u></b>		
National Poultry Waste Management Symposium	Mar/Apr	4

## Calendar - 2001

### **March 23**

American College of Poultry  
Veterinarians Nutrition Workshop -  
"Nutritional Challenges for the 21<sup>st</sup>  
Century". UC Davis.

### **March 24-26\***

Western Poultry Disease Conference.  
(50<sup>th</sup> 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.

### **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>

**Doug Kuney, January/February Editor**  
**Area Farm Advisor**  
**UCCE Riverside County**  
**Tel. 909/683-6491**  
**e-mail: [drkuney@citrus.ucr.edu](mailto:drkuney@citrus.ucr.edu)**

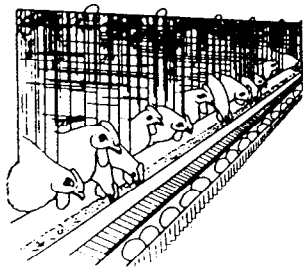
**Ralph A. Ernst, Technical Editor**  
**Extension Poultry Specialist**  
**Animal Science Department**  
**University of California**  
**Davis, CA 95616-8521**  
**Tel. 530/752-3513**  
**Fax. 530/752-8960**  
**e-mail: [raernst@ucdavis.edu](mailto:raernst@ucdavis.edu)**

Department of Animal Science  
University of California  
Davis, CA 95616-8521

Non-Profit Org.  
U.S. Postage  
**PAID**  
U.C. DAVIS

COOPERATIVE EXTENSION

UNIVERSITY OF CALIFORNIA



# California Poultry Letter

January-February 2001

*Contents:*

Poultry Health Symposium  
Energy Efficient Ventilation Fans  
Tests for DNA  
California Poultry Letter Index - 2000  
Calendar