

California Poultry Letter

University of California • Cooperative Extension

July-August 2001

CEQAP Meets Addresses Funding/Flock Care

The Quality Assurance Advisory Committee met in Ontario on August 1. David Castellan, CDFA, Animal Health, reported that there were seven California outbreaks of SE in the year 2000 and only one was thought to be egg associated. There were still 1082 individual California cases of illness where SE was the bacteria isolated. This suggests to some observers that CEQAP is working, however, we caution producers to maintain QA procedures and records!

The CEQAP subcommittee on animal care reported that they had studied this issue and had no formal recommendation at this time. A suggestion was made that all CEQAP members be required to attend an educational program based on the principles of good flock care. Members would have two years to complete this requirement and completion would also be credited as appropriate update training. The program would be videotaped and members not able to attend could view the video and become certified by passing a test (90% or higher required) based on the content of the program. This recommendation was officially passed by a majority of those present.

Representatives of the CEC reported that the Commission Board had suspended collection of assessments as a result of the Supreme Court decision on the mushroom marketing order. The Commission can no longer fund CEQAP consultants David Goldenberg and Gregg Cutler. Interest was expressed that industry seek other methods of funding the program consultants. After considerable discussion PePa's Debbie Murdock indicated that the PePa Board would investigate options and attempt to develop a recommended plan. This will be reported at the next CEQAP meeting scheduled for October 4, 2001 in Sacramento.

Research Report - Inactivation of Bacteria in Stacked Poultry Litter

This research was conducted by Joan Jeffrey, E. Atwill, J. Kirk, J. Cullor and D. Hirsh, School of Veterinary Medicine-UCD, at the VMTRC in Tulare, CA. The project was funded by a grant from the U.S. Poultry & Egg Association. A more complete summary is available at <http://www.vmtrc.ucdavis.edu/poultry/industry.htm>.

This project studied changes in temperature, moisture and pH of stacked poultry litter in an attempt to develop measurable parameters for conditions which will eliminate pathogens. The survival of *E. coli*, *Campylobacter* and *Salmonella* bacteria in piles was also determined.

Survival of bacteria in stacked litter was poor. The maximum time after inoculation that bacteria were recovered was two hours for *Campylobacter*, 32 hours for *E. coli* and 28 hours for *Salmonella*. The majority of the piles reached peak temperatures of 120°F to 155°F. Temperature readings varied by depth and height of probe placement. Temperatures peaked between two and 10 days after stacking and declined slowly over the next 10 days. Water activity had the greatest single influence on the temperature profile of the stacked litter. Piles with greater moisture content consistently reached higher temperatures during stacked storage than drier piles.

These results indicate that deep stacking can be a useful method of reducing bacteria in poultry litter and define methods for accurate monitoring for temperatures that should result in microbial killing.

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Economics of Commercial Layer House Ventilation

An environmentally controlled poultry house is one in which temperature, air quality, air flow rate, and even light intensity can be modified by the operator to meet a desired standard. The goal is to provide, as far as is economically possible, the optimum requirements for best bird health, freedom from stress, and the most efficient utilization of feed for good egg production. Ventilation is the key element in environmental control, and in most cases temperature is the most critical environmental factor to be controlled. Thus the design and management of the ventilation system are vital to achieving optimum egg production at the lowest possible cost.

Optimum Temperature

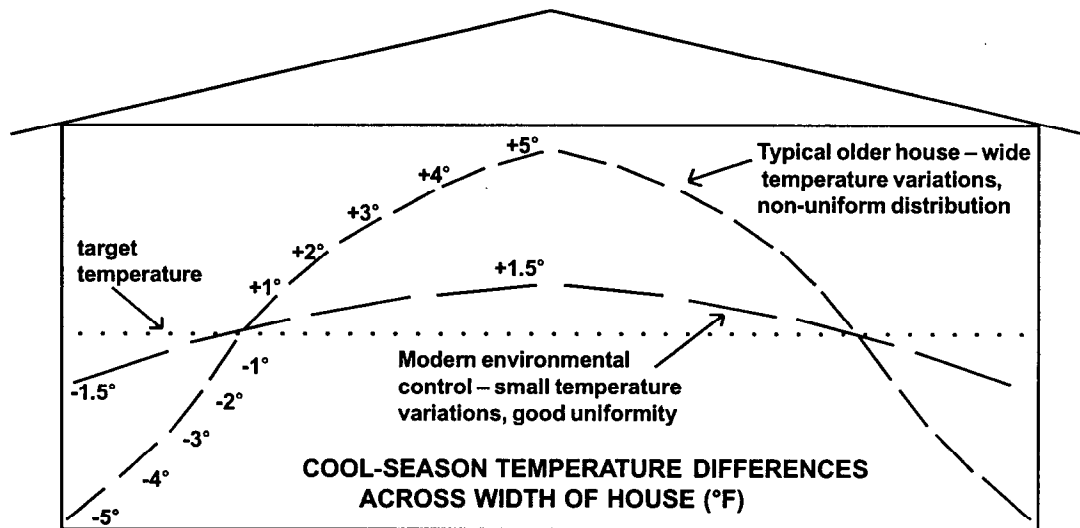
The temperature requirements of laying hens vary according to their age. Optimum temperature for best production is typically lowest as they begin laying, rises slightly until they reach peak production, levels off for some time, then drops somewhat as the birds age further. Temperature requirements also are known to vary somewhat from flock to flock. One of the challenges to successful ventilation management is selecting the right target temperature for the particular situation. The next challenge is managing the system to maintain the target optimum temperature in the house as consistently as possible. While no operator and no ventilation system can be expected to maintain perfectly exact temperature control, the goal always is to get as close as possible to the target temperature, avoid temperature swings of more than a few degrees, and maintain temperature uniformity throughout the house from end to end and top tier to bottom tier.

Ventilation Uniformity

Modern environmental control systems enable operators to fairly closely control in-house temperatures, at least on the average. One of

the biggest current problems is achieving good temperature uniformity in the house. A limited number of studies have been done in commercial egg houses that show temperature differentials across building widths, from end to end of a house, and also from the bottom tier of cages to the top. The exact pattern and extent of the deviations of course depend on the particular building design, the environmental control system used, and the level of management. But it is not unusual to find temperatures in different parts of a house ranging 10 degrees F (5.6°C) or more above and below the desired temperature. The illustration on page 3 shows the kind of cool-season temperature variations across the width of a house that are likely to be seen in older houses, compared with the much more even temperature distribution possible with the best modern ventilation technology under good management. If temperatures vary more than one or two degrees across the house, or from top to bottom, even if the average in-house temperature is as desired - typically, this will be in the vicinity of the sensors - then only a fraction of the hens will be experiencing the desired temperature.

Temperature differentials have considerable economic implications because temperature influences egg size and, most importantly, feed intake. Where temperatures are persistently higher than desired, birds will consume less feed and may not get the required nutrient intake for best egg production. Where temperatures are too low, birds tend to consume more feed, which increases the cost without improving production. In time, temperature stratification, and the accompanying variations in feed intake, also affect the body weight uniformity of the flock. Birds in warmer regions of the house tend to lose body weight and birds in cooler regions tend to gain weight. This results in even greater feed intake differentials and makes ventilation management even more difficult because the target temperature goal depends to a great extent on bird size. There is no way to provide "optimum temperature" for a flock with varying sizes of birds.



Ventilation Affects Costs

To illustrate the profound effect that temperature management can have on cost of production and profitability, consider the following real world example, based on actual field data observed in a Midwest commercial complex where modern, controller-operated environment housing is being compared to older fan-ventilated facilities with poor temperature and ventilation management. Two houses, each containing 100,000 hens, are being compared on a yearly basis. The study has not been completed, so that temperature control data are available for cool-season ventilation only, but the findings are already significant:

	Modern House	Older House
Observed temperature range (cool weather)	74°-82°F	55°- 85°F
Feed consumption per dozen eggs produced	3.2 lb.	3.7 lb.
Feed cost per dozen eggs (@ \$145/ton)	\$0.23200	\$0.26825

In the older house, with temperatures ranging over 30 degrees F (from 55° to 85°F), feed consumption averages one-half pound more feed consumed per dozen eggs produced. At a feed cost of \$145 per ton, or \$0.0725 per pound, this means that the feed cost per dozen eggs in the modern house -with only an 8-degree temperature range - is \$.03625 per dozen lower than in the older house.

This of course is only one example, but it is consistent with published reports of other field tests showing savings of \$0.50 per hen per year and more from closer temperature control in layer housing. And it illustrates the profound effect temperature has on feed consumption and on the cost of production. Other factors, such as egg size, shell quality, and mortality are also very important and have economic value. But even if we look only at the feed consumption factor, it is becoming clearer and clearer that effective temperature control is as important to economics and profit as good feed and water.

*Jim Donald
Extension Agricultural Engineer and Professor
Auburn University*

Scientists Crack Code of Virus That Causes Marek's

In a step towards creating new chicken vaccines, Agricultural Research Service scientists have cracked the biochemical code of the herpesvirus that causes Marek's disease.

Severe cases of Marek's can cause cancerlike tumors, partial paralysis and other disorders in afflicted birds. Although vaccines made from benign or disabled Marek's strains are commercially available, some are failing to immunize the birds against virulent new forms of the virus that have emerged. Bird deaths, diminished egg laying and carcass condemnation costs at processing plants due to Marek's cause an estimated \$1 billion loss annually worldwide, and up to \$100 million in the United States alone.

In recently published studies, ARS researchers led an effort to chart the nucleotide sequences for two Marek's disease strains--MDV1-Md5 vv and MDV1-GA--and a non-disease-causing variant in turkeys called serotype 3, which is used to vaccinate chickens. Nucleotides are chemical subunits whose arrangement spells out the DNA alphabet for the virus's 100-plus genes.

Now available on the GenBank database, Marek's nucleotide coding will help speed the identification of viral genes and mechanisms by which the pathogen survives in nature, evades a host's immune system and causes disease, according to Sanjay Reddy, a medical safety officer at ARS' Avian Disease and Oncology Laboratory, East Lansing, Mich.

There, Reddy and colleagues Lucy Lee, Robert Silva and Richard Witter are using information gleaned from Marek's nucleotide coding to study the genes it uses to produce tumors in chickens, as well as silence them. They've also begun using gene-splicing techniques to design recombinant vaccines to better protect chickens from GA and Md5 vv, as well as other virulent Marek's disease strains.

Both are tumor-causing members of a herpesvirus family that researchers around the world have been studying for more than 20 years and--until

now--only partially decoded, notes Lee, a research chemist.

A more detailed story about the work appears in this month's issue of Agricultural Research magazine (see <http://www.ars.usda.gov/is/pr/>).

ARS is the U.S. Department of Agriculture's chief scientific research agency.

Jan Suszkiw, USDA

2001 Egg Preparation Demonstration Champions

California 4-H Qualifier in Egg Preparation Demonstration was held August 7th at U.C. Davis. The purpose of the contest is:

1. To develop leadership abilities, build character, and assume citizenship responsibilities.
2. To acquire knowledge of egg quality standards, size classification, commercial production, nutritional value, storage, versatility and economic value of eggs.
3. To develop creative skills in preparation, use and serving of eggs.
4. To learn to enjoy eggs as a food.

Judges Richard Booher (Co-owner, Valley Wine Company, Davis), Tony Cobarrubia (Valley Fresh Foods, Turlock), and Pat Ernst (Davis) evaluated the competitors.

Marta Kroger of Vacaville was chosen Junior Champion for her Chocolate Angel Food Cake. To represent California at the National 4-H Poultry & Egg Conference this November in Louisville, Kentucky, the judges chose Jonathan Withrow of El Dorado. Jonathan's presentation featured Denver Scrambled Eggs.

We are proud to have these young men and women promoting California fresh eggs.

Francine A. Bradley
Extension Poultry Specialist

Updated Book Available

The reference book Scott's *Nutrition of the Chicken* has been updated and expanded by S. Leeson and J.D. Summers. The new edition contains chapters on digestion, energy, proteins and amino acids, vitamins, minerals, non-nutritive feed additives, factors affecting nutrient needs, feed ingredients and formulation, measurement of nutrient quality and natural toxins. It can be obtained by surface mail from University Books, P.O. Box 1326, Guelph, Ontario N1H 6N8, Canada for \$65 US; e-mail unilee@sentex.net.

2001 Calendar

August 14

Squab Quality Assurance Program meeting, Harvest Hall, Stanislaus County Agricultural Center, 3800 Cornucopia Way, Modesto, California. The program will run from 6 p.m. to 9 p.m. and is open to interested persons. For more information contact Joan Jeffrey jjeffrey@vmtrc.ucdavis.edu.

August 26-31

International Egg Commission, Bergen, Norway.

September 1-4

World's Poultry Science Association Animal Welfare Symposium, Zollikofen, Switzerland.

*September 9-12

IX European Symposium on the Quality of Eggs and Egg Products, Istanbul, Turkey.

September 16-17

California Poultry Federation Annual Meeting and Conference, DoubleTree Hotel, Monterey. For information <http://www.cpif.org/News/events/calendar.htm> or e-mail CalifPoultry@cs.com.

*October 4

California Egg Quality Assurance Program Committee Meeting, Sacramento. For more information contact Debbie Murdock, PePa, 916-441-0801 or e-mail [<dmurdock@ns.net>](mailto:dmurdock@ns.net).

October 24-26

10th Annual Better Composting School, Hanover, MD. Sponsored by Maryland Cooperative Extension. For more information call 301-405-1198.

*November 6-7

UC Poultry Symposium and Egg Processing Workshops.

**Approved for CEQAP Credit*

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July/August Editor

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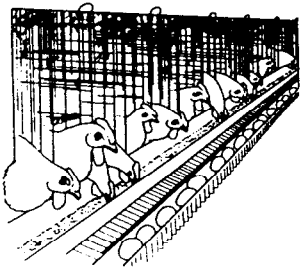
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