FDA Finalizes Safe Handling Labels and Refrigeration Requirements for Marketing Shell Eggs

"Consumers will soon have more safe handling information and new refrigeration requirements to help prevent Salmonella Enteritidis.

"The U.S. Food and Drug Administration today issued a final regulation, to improve food safety as it pertains to eggs. The refrigeration requirement will be effective in six months, while the safe handling requirement will be effective in nine months."

The new regulations by the FDA will require shell egg cartons to bear safe handling instructions. The required statement is as follows:

"Safe Handling Instructions: To prevent illness from bacteria: keep eggs refrigerated, cook eggs until yolks are firm, and cook foods containing eggs thoroughly."

Additionally, the rule requires that eggs be placed promptly under refrigeration at 45 degrees F. or lower upon delivery at retail establishments (supermarkets, restaurants, delicatessens, vending operations, hospitals, nursing homes, and schools).

For more information on handling eggs and other foods call toll-free

1 (888) SAFEFOOD
Web site: www.cfsan.fda.gov

Source: Food and Drug Administration
November 30, 2000

One Degree (F) May Not Seem Like Much, But It Can Represent a Lot of Money

Managing controlled environment layer house temperatures is a skill that only a few egg producers have mastered. It's one thing to be able to maintain a given temperature, but it's a far more difficult task to provide air of good quality to all parts of the house.

Relatively few houses are designed to deliver fresh tempered air equally to all birds. In many cases the delivery pathway is too long resulting in temperature and air quality variations along the way. Tall banks of cages with dropping boards and/or belts often interfere with the free flow of air.

Microclimates within poultry houses of 5, 10, and 15 degrees (F) differences are common in even the most "state of the art" houses being built today. What does this cost in terms of added feed costs? What are the effects of high humidity? What are the costs of high ammonia levels?

In a 1997 National study of more than 200 layer houses, we found an average winter house temperature of 73.6°F with a range from the mid 60's to the high 70's. Summer temperatures on the other hand averaged 78.8°F with a range from the low 70's to the mid 80's. This, of course, says nothing about air quality or the variability of temperatures within the house. If we look at just the temperature effect, we could calculate the effect of one degree lower temperature (assuming it occurred for one entire year).

70°F minus 1 degree = a feed cost of 21.7 vs 21.6 cents per dozen = 2.2 cents per hen = $2.200 per house per year. And that's only one degree!
Molting Methods Compared

During the 33rd North Carolina Layer Management Test, two molting methods were compared for the period 66 to 110 weeks of age in white and brown layers. Four white and four brown strains were used in this 44 week test. Molting procedures were:

1. Fourteen days fasting followed by a 16% protein low calcium resting diet.

2. Five days fasting followed by a 10% protein low calcium resting diet.

At 4 weeks, both flocks were returned to regular laying rations and lighting programs.

Table 1 lists the 28 day body weight losses and total mortality for white and brown birds.

Table 1. (Weeks 67-70)

<table>
<thead>
<tr>
<th>Trait</th>
<th>Fast (days)</th>
<th>White</th>
<th>Brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 day BWt (% loss)</td>
<td>14</td>
<td>24.5</td>
<td>23.2</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>20.5</td>
<td>18.9</td>
</tr>
<tr>
<td>28 day Mortality (% total)</td>
<td>14</td>
<td>2.04</td>
<td>2.20</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1.79</td>
<td>1.96</td>
</tr>
</tbody>
</table>

In both white and brown layers, body weight and mortality losses were similar and were greater with the longer fasting period. Note, though, that body weights are not shown at the end of the fasting period (14 or 5 days respectively) when they would have been more that at 28 days.

Body weight losses were targeted at 30 and 25% for the 14 and 5 day fasting methods respectively.

Results during the second laying cycle are listed in Table 2.

Table 2. (Weeks 71-110)

<table>
<thead>
<tr>
<th>Trait</th>
<th>Fast (days)</th>
<th>White</th>
<th>Brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs/HH</td>
<td>14</td>
<td>169.2</td>
<td>163.8</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>164.9</td>
<td>165.4</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td>14</td>
<td>5.5</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5.5</td>
<td>5.8</td>
</tr>
<tr>
<td>Daily feed (lbs/100 hens)</td>
<td>14</td>
<td>24.2</td>
<td>25.1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>24.6</td>
<td>25.1</td>
</tr>
<tr>
<td>Large + XL eggs (%)</td>
<td>14</td>
<td>96.8</td>
<td>97.6</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>96.5</td>
<td>97.4</td>
</tr>
<tr>
<td>Grade A (%)</td>
<td>14</td>
<td>97.1</td>
<td>97.1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>97.1</td>
<td>97.4</td>
</tr>
</tbody>
</table>

Differences between the two molt methods were minimal. Breed of birds appeared to interact with the molting method, especially for hen-housed egg production. In this case, the longer fast resulted in higher egg numbers in white breeds, but fewer eggs in brown breeds.

The overall comparison, though, should include both the molt period and subsequent periods in a complete economic analysis.

***

Do Strains Perform Differently Under Various Space Allowances?

This issue has been studied extensively through the years and strains do appear to perform differently with respect to density. The issue is not simple as strains do require different management procedures in many areas and cage density tests tend to maintain management...
methods the same for all strains with variations only allowed in space allowances.

In addition, density (floor space per bird) does not measure all the factors that will change when birds are added to existing cages. Feeder space per bird and bird numbers (colony size) also change at the same time.

In 1983, we studied 7 different cages sizes/shapes with a total of 17 combinations of cage design × hens/cage. Table 3 lists the various combinations.

Table 3. Cage Sizes and Hens/Cage.

<table>
<thead>
<tr>
<th>Width (in)</th>
<th>Depth (in)</th>
<th>Hen/cage</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>18</td>
<td>3 &amp; 4</td>
</tr>
<tr>
<td>18</td>
<td>12</td>
<td>3 &amp; 4</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>2 &amp; 3</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
<td>3 &amp; 4</td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>4,5,6</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>5 &amp; 6</td>
</tr>
<tr>
<td>24</td>
<td>18</td>
<td>6,8,10,12</td>
</tr>
</tbody>
</table>

A highly significant effect on eggs per hen housed, mortality, and egg income minus feed cost was found to exist for the combined factors of both hens per cage and floor space per hen.

Strains have been repeatedly compared in tests conducted at the North Carolina Layer Management Test. The last two tests compared different cage sizes while bird numbers were held constant. This, therefore measured only the two factors, floor space and feeder space per bird. In the field, changes in cage density also change colony size.

Table 4 illustrates the variations in performance for different strains (A,B,C,D) using two different cage sizes per test.

<table>
<thead>
<tr>
<th>Trait/Str.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH eggs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 in²</td>
<td>257.8</td>
<td>267.5</td>
<td>267.7</td>
<td>261.4</td>
</tr>
<tr>
<td>48 in²</td>
<td>254.4</td>
<td>248.1</td>
<td>252.5</td>
<td>250.1</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 in²</td>
<td>6.1</td>
<td>5.3</td>
<td>7.5</td>
<td>12.2</td>
</tr>
<tr>
<td>48 in²</td>
<td>5.7</td>
<td>8.1</td>
<td>9.8</td>
<td>17.6</td>
</tr>
</tbody>
</table>

* To 67 wks of age.

Table 5. NC State 33rd Test (4 bird cages).*

<table>
<thead>
<tr>
<th>Trait/Str.</th>
<th>A</th>
<th>C</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH eggs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 in²</td>
<td>265.9</td>
<td>280.1</td>
<td>265.0</td>
<td>280.6</td>
</tr>
<tr>
<td>48 in²</td>
<td>256.9</td>
<td>256.5</td>
<td>242.0</td>
<td>260.7</td>
</tr>
<tr>
<td>Mortality (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 in²</td>
<td>4.5</td>
<td>12.3</td>
<td>6.2</td>
<td>7.2</td>
</tr>
<tr>
<td>48 in²</td>
<td>6.2</td>
<td>15.2</td>
<td>11.6</td>
<td>11.7</td>
</tr>
</tbody>
</table>

* To 66 wks of age.

The greater space allowances consistently resulted in higher egg production in both tests. Average hen housed egg production for the strains listed, favored the lower density by 12.3 and 18.9 eggs for the 7 and 4 bird per cage tests, respectively.

Strains were affected by as little as 3.5 to as much as 19.4 eggs in the 7 bird test and from 9.0 to 23.6 eggs in the 4 bird test. In both tests, strain A was the least affected by space restriction.

Mortality averaged 10.3% vs 7.8% in high density vs low density cages in test #1 compared to 11.2% vs 7.6% in test #2. In 7 of 8 comparisons (tables 4 & 5), mortality was greater in the higher density comparisons.
It should be noted that the differences in performance are for only 46 weeks of lay and not for a full year. The extra 6 weeks would add another 1-2 eggs to the differences noted. In addition, second cycle results (after a molt) are similarly reduced as a result of higher densities.

A copy of the 1983 report with 7 different cage sizes is available from the author. It includes formulas which relate the combined effects of floor space and colony size to egg production, mortality and egg income minus feed costs.

Copies of the 32nd and 33rd North Carolina Management Reports are available from:

Dr. Ken Anderson  
Poultry Science Dept  
North Carolina State University  
Box 7608  
Raleigh, NC 27695-7608  
Tel: (919) 515-5527  
e-mail: ken_anderson@ncsu.edu

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Ammonia - Its Effect on Poultry

The recent release of the United Egg Producer’s “Animal Husbandry Guidelines and the subsequent McDonald’s recommendations for their suppliers has brought new attention to the subject of ammonia in the laying house. The UEP guidelines are based upon a scientific committee’s recommendations and are stated as follows:

“Poultry houses should be designed to provide a continuous flow of fresh air for every bird. Sufficient ventilation to minimize levels of carbon monoxide, ammonia, hydrogen sulfide, and dust is critically important. Ammonia concentrations to which the birds are exposed should ideally be less than 25 ppm and should not exceed 50 ppm for a 24 hour time-weighted average (TWA), but temporary excesses should not adversely affect bird health”.

The McDonald’s requirement reads:

“Provisions must be made to ensure that aerial contaminants do not reach a level at which they are noticeably unpleasant to an observer.

“Ventilation systems, natural or forced, must be designed to maintain air quality parameters below the following levels at bird head height:

1. Ammonia 25 ppm  
2. Carbon dioxide 5000 ppm

“Where possible, these levels will be automatically recorded and the records made available for review upon request.

“Inhalable dust, carbon monoxide and other aerial contaminants within hen buildings must be kept at levels which comply with local regulations. Specifically, averaged over an 8-hour period, dust must not exceed 5 mg per cubic meter and carbon monoxide must not exceed 50 ppm”.

Comments: The primary consideration concerning ammonia levels in poultry houses should be for the employees. Whatever standards are applied to humans must be the maximum allowed standard for poultry as well since employees effectively spend their entire day in the poultry house. Consideration of reducing these standards to levels below that required for employees should be based only upon repeatable research. It is doubtful that sensitivity levels below 25 ppm should be established based upon current reviews of the literature.

Even though there have been hundreds of experiments with poultry at different concentrations of ammonia, practically no research has been done under “practical” conditions with modern controlled-environment, mechanically- ventilated housing systems and current manure handling procedures. Much of the work has included other simultaneous stresses such as exposure to various disease agents. Most research uses “constant” exposure rather than the diurnal exposure common to most commercial poultry houses.
There appears to be a lack of data regarding ammonia levels in commercial houses on both a diurnal and seasonal basis. There also appears to be no documentation of the effect of housing types or manure handling procedures. Are birds reared in open houses exposed to the same ammonia problems as those housed in controlled environment housing? Do birds housed in the Southern tier of states experience the same ammonia levels as those in the Northern tier? Does daily or weekly removal of manure result in different ammonia levels and patterns compared to the manure storage conditions in a high-rise house? Can layer houses be maintained at recommended temperature levels and still have less than 25 ppm of ammonia if cage density is reduced especially in the winter months?

Research appears to be limited to constant exposure of ammonia at various flock ages. Practically no research has been done with ammonia levels under 25 ppm. Are effects the same if daily fluctuations vary + or - 25% from the daily mean? Will a 100 ppm peak of ammonia for 1 or 2 hours a day have a different effect compared to a constant level of 100 ppm for the entire day?

Damage to the chicken due to ammonia ranges from microscopic changes in the respiratory system to lack of growth and at extreme levels, mortality. At 25 ppm or more, feed consumption and body weights are commonly affected when birds receive constant exposure. Damage to the eye is usually one of the earliest symptoms of ammonia damage. Exposure to 25 ppm and higher levels aggravate symptoms when disease organisms are present. Layers do not appear to be affected at 50 ppm. Levels of 80 ppm and more appear to affect egg production.

Various reports state that man can detect ammonia at concentrations as little as 5-10 ppm, but more typically at 15-20 ppm. The nose rapidly loses sensitivity to ammonia. Even a skilled manager can quickly be rendered incapable of detecting even moderate levels of ammonia. The ability to detect ammonia does not automatically equate to human discomfort or flock problems.

It is suggested that a thorough study of current air quality be conducted in commercial poultry houses in different seasons and regions utilizing various housing and manure handling procedures. This is needed to determine areas of weakness within our industry regarding our current systems of housing and management.

An evaluation of monitoring equipment for one-shot and continuous recording should be undertaken with emphasis on cost, accuracy, calibration, and maintenance.

Until such information is available, it is suggested that the current standards used for humans be applied to the poultry industry as well.

Finally, even though humans vary in their ability to detect ammonia and their ability changes over time, any time workers complain of discomfort, this should be fair warning that the ammonia levels are also too high for the flock.

A well-written review of this subject has been published in the World’s Poultry Science Journal (September 2000) authored by H.H. Kristensen and C.M. Wathes of the UK. This paper reviews the evidence for ammonia exposure affecting various aspects of poultry welfare.

An 84 item bibliography on Ammonia and Its Effects on Poultry is also available from the author (Don Bell) and can be obtained as an attachment to an e-mail letter. Write or telephone him at the address below and request a copy of the bibliography on ammonia.

Telephone: 909/787-4555
E-mail: don.bell@ucr.edu
Salmonella Enteritidis in Table Egg Layers in the U.S. - The Layers '99 NAHMS Report

The USDA's National Animal Health Monitoring System (NAHMS) designed the Layers '99 study to provide both participants and the table egg layer industry with information on the U.S. layer industry.

Publications (Part 1 and Part 2) described general layer and pullet management practices. The current publication (see title above) was issued in October 2000 and describes SE monitoring and prevention practices with environmental and mouse culture results.

From May 3 through October 22, 1999, environmental samples to be tested for SE were collected throughout 200 layer houses from manure, egg belts, elevators, and walkways. Seventeen samples were collected for each of the 200 houses in the study. Rodents were collected in 129 houses.

Partial results:

- SE was found in 7.1% of the layer houses.

- Flocks less than 60 weeks of age were 4.7 times more likely to test positive than older, non-molted flocks.

- Flocks that were 0-16 weeks post-molt were 9.3 times more likely to test positive than were 60+ week-old non-molted flocks.

- Overall, 3.7% of house mice cultured were positive for SE.

Copies of these reports describing the U.S. egg industry are available on request at:

NAHMS
555 South Howes
Fort Collins, CO 80521
Phone (970-490-8000)

E-mail: Nahmsweb@usda.gov

or at their web site:

www.aphis.usda.gov/vs/ceah/cahm

* * *

2000 U.C. Poultry Symposium Proceedings Available

The following papers are currently available on Cooperative Extension's web site.

Practical Problems in Layer and Pullet Nutrition
John Kuhl

Developing Science-Based Animal Welfare Guidelines - J.A. Mench and J.C. Swanson

Recent Progress in Poultry Pest Research - Bradley A. Mullens

Designer Eggs: Nutritional and Functional Significance - J.S. Sim and H.H. Sunwoo

The Changing Economy of the Egg Industry - Dick Magoffin and Dick Chilson

Animal Welfare: Consumer viewpoints - J.C. Swanson and J.A. Mench

Flock Friendly Molting Methods: A Progress Report - Don Bell

http://animalscience.ucdavis.edu/extension/avian
South African Poultry Association’s Poultry Welfare Standards


“The code was compiled by SAPA as an objective guide for all poultry produced in South Africa and in an endeavor to lay down the accepted norms of the industry, incorporating various legal requirements where necessary.

“The Code provides defined standards of well-being for poultry in commercial operations, research and educational facilities. The recommendations are to be used as a guide and do not consider all possible conditions.

“Adequate facilities and resources must be available to supply proper housing, the supply of quality feed, attendance to sick and injured chickens and all else to ensure the well-being of the animals. Financial costs should not be considered a reason for neglecting a chicken obviously in distress or for failing to secure prompt and appropriate medical treatment or other care when necessary.”

These are a very thorough set of codes covering chickens (both table egg and broilers), turkeys and geese as well as hatcheries, breeders, floor, and cage systems. SAPA has also included standards for free range production, barn type housing, catching and transport as well as for processing plants for chickens.

A copy of this 7 page document can be obtained from Don Bell’s office.

We’ve highlighted a few of the more interesting items below:

• Beak trimming, claw trimming and identification marking shall be avoided except when it is considered necessary. Only competent persons shall perform any such procedures

• Methods of molt inducement and controlled feeding, which deprive fowl of water for more than 24 hours or feed for more than 48 hours shall not be performed. Both practices shall only be carried out on healthy fowl under close management supervision and conditions that will not cause stress.

• Chicken flocks shall be observed at least twice a day. The arrangement of a chicken pen or cages shall permit easy inspection.

Space requirements are listed in Table 6.

Table 6. SAPA Space Requirements for Chickens Housed in Cages.

<table>
<thead>
<tr>
<th>Age (wks)</th>
<th>Cage floor sq. in. per bird</th>
<th>Feeder space inches per bird</th>
<th>Birds per water cup or nipple</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6</td>
<td>34</td>
<td>1.0</td>
<td>15</td>
</tr>
<tr>
<td>6 to point-of-lay</td>
<td>45</td>
<td>2.2</td>
<td>8</td>
</tr>
<tr>
<td>adult</td>
<td>70</td>
<td>4.0</td>
<td>5</td>
</tr>
</tbody>
</table>

***
Calendar for Poultry Events - 2000

January 15-16
International Poultry Science Forum.
Georgia World Congress Center,
Atlanta, GA.

January 17-19
53rd Annual International Poultry
Exposition. Georgia World Congress
Center, Atlanta, GA.

February 3
Avian Science Day. UC Davis.

February 26-27
California Poultry Federation’s Spring
Board of Directors Meeting and
Lobbying Day. Sacramento.

March 13-15
Midwest Poultry Federation Convention.
St. Paul, MN.

March 14-15
American Egg Board. Atlanta, GA.

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

March 28*
UC Poultry Health Symposium,
Riverside.

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.

June 16-19
California Poultry Federation’s
Washington D.C. legislative trip.

June 19-21
Oregon/Washington Poultry Association
Conference. Wetches, Oregon.

July 11-12
American Egg Board. Chicago, IL.

July 24-29
Poultry Science Association. (combined
meeting with the Animal Science, the
Dairy Science and the Meat Science
Associations). Indianapolis, IN.

July 29-30
California Poultry Federation’s Summer
Board of Directors Meeting. San Luis
Obispo.

August 26-31
International Egg Commission. Bergen,
Norway.

*Approved for CEQAP Credit
2000 Calendar, continued

September 1-4
WPSA 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 Federations’s Annual Meeting and Conference. Monterey.

(More details can be found at the Feedstuffs web-site):

http://www.feedstuffs.com

or at the UC Cooperative Extension site at:
http://animalscience.ucdavis.edu/extension/avian

Did you receive the September/October issue of the California Poultry Letter?

Several names were accidently omitted from our mailing list for the September/October issue of the California Poultry Letter. If you did not receive a copy you can find it on our UC Cooperative Extension web site. If you would like a copy mailed to you please contact Ralph Ernst at the address or telephone number listed below. We apologize for this oversight.

Don Bell, November-December Editor
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Davis, CA 95616-8521
Tel. (530) 752-3513
Fax (530) 752-8960
e-mail: raernst@ucdavis.edu

IN REMEMBRANCE

The following members of the California Poultry Industry passed away in 2000. Our condolences and best wishes go to their families and friends.

Norton Coleman Jan. 10
George Jensen Feb. 25
David Freitas Mar. 30
Martin Breitmeyer Mar. 31
Al Zacky Apr. 24
Elvin Embly June 17
Bud Manheim June 29
Richard Hoover Aug. 21
Lee Jasper Sept. 27
Jerry Armstrong Oct. 5
Wayne Graves Nov. 3
Robert Jackson Nov. 17

May they rest in Peace.
California Poultry Letter

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