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ITEMS OF INTEREST TO MINNESOTA'S EGG INDUSTRY

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PREVENTING BODY-CHECKED EGGS

Recent research at Auburn University has investigated the cause of body checks to suggest methods for producers to reduce this shell defect. Body checks present problems in eggs from some flocks and are little problem in others. In working with this shell quality problem D.A. Roland found body checks ranging from less than 1 percent to 20 percent in different flocks. Eggs were considered body checks if they had ridges or bands and a visible body check around the middle of the egg. Most of the body-checked eggs were laid between 6 a.m. and 8 a.m. He also found the number of body checks increased when more hens were put in the same size cage. When hens were housed 1 per cage, then were changed to 2 or 4 per cage, the number of body checks increased and then decreased again when they were changed back to 1 per cage.

Birds per cage and body checks

Birds/cage	% Body checks 6 a.m. - 7:30 a.m.
2	8.3
3	14.9
4	33.8

In the egg formation process, the yolk is released from the ovary and 4-6 hours later reaches the uterus after the thick albumen and shell membranes have been added. In the uterus the thin albumen is added and shell formation takes place. Yolks that were released in the early morning hours would be eggs covered with a thin calcium layer around 4 p.m. to 8 p.m. The Alabama workers thought that hens with thin-shelled eggs in the uterus might have these shells cracked due to activity in the cages during the early evening hours. The cracks would then be sealed over with calcium as shell formation progressed and a body checked egg would result. They handled hens at 9 p.m. to cause cracking of the shell of the egg in the uterus and obtained body checked eggs the next morning if the membrane was not broken and the egg laid prematurely. In an additional study they reversed the light period (changed from 4 a.m.-8 p.m. to 4 p.m.-8 a.m.) and after a few days in which the number of body checks increased, found the hens adjusting to their new time of lay and most body checks were laid from 2-4 hours after the lights came on.

Based on these findings it was thought if activity of hens with a fragile, thin-shelled egg in the uterus is responsible for body checks, then providing a longer day length should increase body checks and a shorter day length should reduce their number. By adjusting the lighting for a flock they demonstrated that body checks can be increased by longer day lengths. The light period on a flock was extended and then reduced as shown in the following table.

Day length and body checks[1]

Light period	Day length	Body checks (%)
4 a.m. - 8 p,m.	16	7.7
4 a.m. - 11 p.m.	19	18.3
4 a.m. - 8 p.m.	16	5.8
4 a.m. - 6 p.m.	14	1.0

[1] Hens housed 3 per 12 x 16 inch cage

There are a number of findings in this research that producers with flocks having body check problems or managers of layer production facilities may want to consider in evaluating their management practices. Consider the following:

1. There are a number of considerations involved in deciding how many birds to house per cage. This study indicates that the higher densities of cage stocking will tend to produce more eggs with body checks than lesser densities—one more factor to consider.
2. It may be well to avoid unnecessary activity in the laying house sometime during the 12 to about 20 hours after the lights come on. You may want to evaluate times of running feeders, house cleaning activities, and caretaker movement during these hours. Keep in mind that it is desirable to minimize house activity during the greatest period of lay and when egg trays or egg belts are full.
3. Many of our lighting programs have extended the lighting period to as much as 17 and 18 hours per day. A number of studies have shown that a 14-hour day length is adequate for good egg production. This study would indicate that we should look at lighting programs to see if any potential benefits gained by additional lighting may not be offset by shell quality factors such as increased body checks. On an existing flock, remember the basic principle of never decreasing the day length of a flock in production.
4. The study tends to indicate that increased activity in the cages as a result of any factor may promote body checked shells. A light intensity of at least ½ foot candle at the bird level should be provided throughout the laying house. Intensities greater than this may be detrimental in that birds may scare more easily or be more active as personnel move through the house performing necessary functions.

These are some considerations pointed out by research on layers that may have application in your operation, particularly if you have had trouble with excessive body checked eggs in your flock or have had a history of this problem in your operation. Evaluate your management practices in light of these findings and to see if there are modifications you might make to reduce this cause of loss in your operation.

EGG PRODUCTION COMPLEX STUDY

For a better definition of the effectiveness of vaccination and disease prevention programs as well as egg production and quality measurements in an egg production complex, a laying flock survey is being conducted by Mel Hamre, University of Minnesota extension poultry specialist; John Newman, College of Veterinary Medicine, University of Minnesota; and Don Womacks, Sparboe Summit Farms. These findings are based on the first year of the survey and were presented at the August Poultry Science Association annual meeting.

Measurements of blood titre levels for infectious bronchitis, Newcastle disease, and *Mycoplasma gallisepticum* have been taken from specific birds in each of the four houses of the complex at 4 to 6 week intervals. At the same time egg samples for egg weight, Haugh unit, specific gravity, and shell thickness measurements have been taken from each house. An observation of general shell quality is also made for roughness, thin spots, body checks, misshapen eggs, and other shell defects. Egg production and bird mortality records are kept by the complex manager.

No infectious bronchitis (IB) vaccination was conducted once the pullets were moved from the growing houses into the laying complex. No clinical evidence of IB was detected throughout the study period. The IB virus cycled in the complex and titre levels varied dramatically between sampling periods. This survey showed IB viruses can spread periodically in the complex without apparent measurable effects on egg production or quality and makes revaccination for IB unnecessary.

Newcastle disease (ND) virus did not cycle like IB virus did in the complex. Birds molted in the complex were given a booster vaccination (B_1, LaSota type in the water). The vaccine virus apparently did not spread to the birds in the other houses in the complex as significant titre rises were not observed in these houses following vaccination. There were some fluctuations in titre levels, but ND virus was not a clinical problem.

Three of the four houses were positive for *Mycoplasma gallisepticum* (M.g.) when the flock survey began. One of these three was emptied and filled with M.g. negative birds 3 months later. These two houses remained negative for the remainder of the year. Eradication of M.g. from a complex appears to be a feasible objective since spread of the organism can be prevented with proper management procedures. If infection should occur it may spread very slowly. The houses which were negative for a year did become M.g. positive, but the fact that they were kept clean for a considerable length of time with positive houses in the complex should encourage attempts to rid complexes of this infection. The economic benefits of a M.g.-free flock have been reported by other researchers.

A good cleanup between flocks is necessary, followed by the housing of M.g. negative birds. Rodents, free-flying birds, and other possible means of infection must be eliminated. Entry to the houses must be restricted to the personnel essential to the operation. Reasonable precautions must be taken to prevent recontamination through contaminated clothing, footwear, and personal contact. Equipment moved between houses and farms must be sanitized.

Fortunately there were no major problems involving egg production, mortality or egg quality during the first year of the study. A slight decrease in shell quality was noted at one sampling period accompanied by a slight rise in IB vaccine titre and at one period following another slight titre rise. A decline in egg quality measurements may occur from time to time and be due to factors other than disease—age of bird, weather changes, strain differences, or management factors. Limited sampling of eggs from a flock may not be adequate to pick up all changes that occur, but coupled with observations of caretakers and egg handlers can provide useful information to management regarding evaluation of eggs from the flocks. In addition to making determinations helpful to the complex management, it is hoped that these field study findings will provide useful information on management and disease control practices which is helpful to the poultry industry.

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