

Flock-Friendly Molting Methods - A Progress Report

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Introduction

Public concern about the welfare of farm animals has resulted in the need to re-evaluate current recommendations concerning the many facets of care for table egg chickens. In some cases, restrictive legislation has been the result of this public concern, specifically in Europe and Australia. In the US, in recent months, several state legislatures have considered proposals to mandate space requirements for commercial layers in cages and to disallow the use of induced molting. In addition, one major user of eggs has developed its own set of guidelines for their egg suppliers which include both space and molt method restrictions.

Over the past twenty or more years, traditional molting techniques, which involve feed removal, have been severely criticized by welfare groups. As a result, a variety of alternative methods have been studied and in some cases implemented. Still, today, the most common method to induce a molt in commercial chicken flocks involves the removal of feed for periods from 5 to 14 days.

What Does the Rest Accomplish?

There are many theories why a rest, and its associated physiological changes, yields a rejuvenation effect. First, traditionally initiated rests result in significant losses in body weight. At least 25% of this loss is associated with regression of the reproductive system (Brake & Thaxton, 1979). The remainder is attributed to loss of weight in body fat, feathers, liver tissue, musculature and skeleton. The regression of the ovary and oviduct have significant effects on the quality of eggs produced in the second cycle of performance. The efficiency of albumen secretion is improved as evidenced by increases in the thick albumen component. Calcium secretion is more effective as shell thickness is increased and shell smoothness is improved. The egg production rate is dramatically improved probably due to improvements in clutch size, fewer "loss" eggs, and the rejuvenation of non-layers. Some improvement in egg production can also be attributed to an increase in mortality (during the molt) of inferior non-producing birds. And finally, the improved appearance of the flock and its reduced requirement for maintenance energy results from the replacement of feathers.

Many experiments have studied the apparent relationship between loss of body weight and subsequent performance. In most cases, there appears to be a positive relationship between weight loss and economic returns in the 15 to 35% loss range. Attempts to reduce the weight loss while maintaining the non-productive rest period have usually not proven to be effective or economically viable options.

Fasting vs Nutrient Restriction

Fasting is a term which means food removal - some prefer to call it "starvation". Regardless of the terminology used, it is a widely followed practice in many countries for humans and has been used extensively in the rejuvenation process for chicken flocks for decades. Early molting methods incorporated a 4-5 day feed removal period along with 1-3 days of water removal. Over the years, most flock managers have eliminated the removal of water and have increased the number of days of feed removal. World-wide, the use of fasting is by far the most common method of inducing a molt. Because of the perception that the birds are being starved, many countries now prohibit fasting as a means to initiate a molt.

In the 1960's, researchers experimented with "low nutrient molt mashes". The diets were meant to be full-fed. It was readily apparent that the reduction of protein, calcium or other critical elements to sub-requirement levels could sustain low (less than 5%) levels of egg production for extended periods and results appeared to be comparable to the methods using the fasting technique.

UC experiments with these methods have failed to show significant economic differences when compared to the standard 10 day fast method. Increasing the fast to 14 days, though, appears to improve returns over the 10 day fast method.

Today, low nutrient programs are the only ones available in countries with regulations prohibiting the complete removal of feed. Such methods are very simple to implement and oftentimes require only low nutrient ingredients with small modifications to meet vitamin and trace mineral requirements. Nutrient restriction, though, can also be criticized as these methods fail to meet all the known nutrient requirements of a mature flock in production. No list of nutrient requirements for poultry currently recommends a set of specifications for a layer flock in a maintenance condition - without egg production.

Based upon previous research at UC and other institutions, the following experiments were initiated to re-visit the subject of low nutrient molting methods for commercial layer flocks with current strains of chickens, new concepts of feeding, and with a new set of urgency brought about by the increase in public concern over the issue.

National Egg Industry Guidelines for Induced Molting

The United Egg Producers (UEP) association of egg producers has established a "Scientific Advisory Panel" on animal welfare issues. This panel is made up of nine scientists, consultants and egg producers. Their charge is to make recommendations to UEP's "Producer's Committee" relative to various animal care practices including induced molting. Two of these recommendations are:

"Producers and researchers are encouraged to work together to develop alternatives to feed withdrawal for molting."

"Until such time that these alternatives are available, the shortest period of feed withdrawal possible should be used to accomplish the goal of rejuvenating the hen's egg production capabilities and overall welfare."

Current Research

University-type research is organized in such a way to be able to measure variation within and between treatments. Considerably fewer birds are required to prove an issue. But, one of the very important issues, mortality, is almost impossible to evaluate in small University experiments. Thus, a combination of the two types of experiments tend to complement one another.

In order to evaluate various molting procedures under commercial conditions, three California egg farms agreed to compare their traditional molting programs with a method which did not require the removal of feed. University of California Poultry Specialists have coordinated these comparisons and have done the analysis of results. Meaningful field tests are difficult to arrange because of the need for replication of treatment and controls (requiring multiple identical houses and sister birds), the extra labor requirements for conducting numerous measurements, and the "risk" that the treatment may result in poor performance and loss of income. Our California cooperators fully understood these associated problems while at the same time recognizing the need for repeated observations on multiple farms.

Objectives of a Molting Method

An ideal molting method should:

- get the flock completely out of production within 5 to 6 days.
- keep the flock out of production (zero production) until it has adequately rested.
- bring it back into production rapidly (as determined by the manager).

- be simple and foolproof to implement.
- be low in cost.
- result in low mortality.
- lead to high subsequent performance

Criteria for developing a flock-friendly molting procedure are:

- no feed removal
- no major loss in body weight
- no increase in mortality
- no injections or use of toxic substances
- comparable performance results
- cost effective

Experimental Design of Current Research

The current research (year 2000) used three farms, two identical houses per comparison (1 treatment house and one control house), sister birds (raised together), four strains (one farm used 2 sets for 2 strains), and the total number of birds started of 357,000. Flocks were between 66 and 70 weeks of age at the start of the experiment.

Sample birds were weighed individually either daily or weekly during the molt phase of the experiment. Egg production, mortality, and feed consumption were summarize daily for the first 56 days, while egg weights were summarized once per week after the return to egg production. All data were entered into the UC flock indexing program for economic analyses. No statistical analyses were made due to the lack of replication within flocks.

Treatments consisted of:

- 1). 10 to 12 pounds (per 100 hens) of ground corn, dical phosphate, limestone, and a grow-lay vitamin/mineral pre-mix per day. Calcium was calculated at 0.8% and available phosphorus at 0.4%. No salt was added to the diet. This diet was fed for 28 days and shall be referred to as the “no salt” diet.
- 2). Each farm’s existing molt program: 6 to 11 days without feed followed by the farm’s molt mash fed ad lib until the 28th day.

Artificial lights were turned off on day one of the molt in open houses (farms B & C) and were reduced to 8 hours per day in the environmentally controlled houses on farm A. Lights were turned back on following the first 28 days and birds were returned to layer diets.

Note: farm A used a 10 day feed withdrawal period, farm B used 11 days, and farm C used 6 days.

Preliminary Results (farm C still has about 14 weeks to go):

- In all 4 comparisons, the no-salt treatments had slightly less first four-week mortality.
- 50% EP was reached between 37 and 46 days with no treatment trends.
- % EP in the no-salt birds averaged 1.4 to 7.2% during weeks 2-4 compared to zero in the control groups.
- % EP during the peak weeks was consistently higher in the control groups.
- HH eggs was higher in 3 of the 4 comparisons in the control flocks.
- Feed per day, case weights, and feed conversion results were variable.
- Av. weekly mortality for the entire period was consistently higher in the no-salt treatments.
- Egg income minus feed costs were higher in the control groups in 3 of the 4 comparisons.

Conclusions

The results confirmed our previous conclusions that feed removal systems were generally superior to other methods. The excellent results of the no-salt diet on farm A, though, indicates that other methods have potential for use in the future when more attention is given to the problems of applying controlled feeding principles equally to all birds.

Before abandoning traditional methods in the face of welfare advocate criticism, it's important that individual companies take a hard look at their present method of molting and if a new method is called for, careful comparisons should be made.

As usual, care must be taken to assure equal conditions for all treatments in farm tests with thorough analyses of all important factors. Use your nutritionist, veterinarian, or Extension Specialist when devising and interpreting such tests.

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