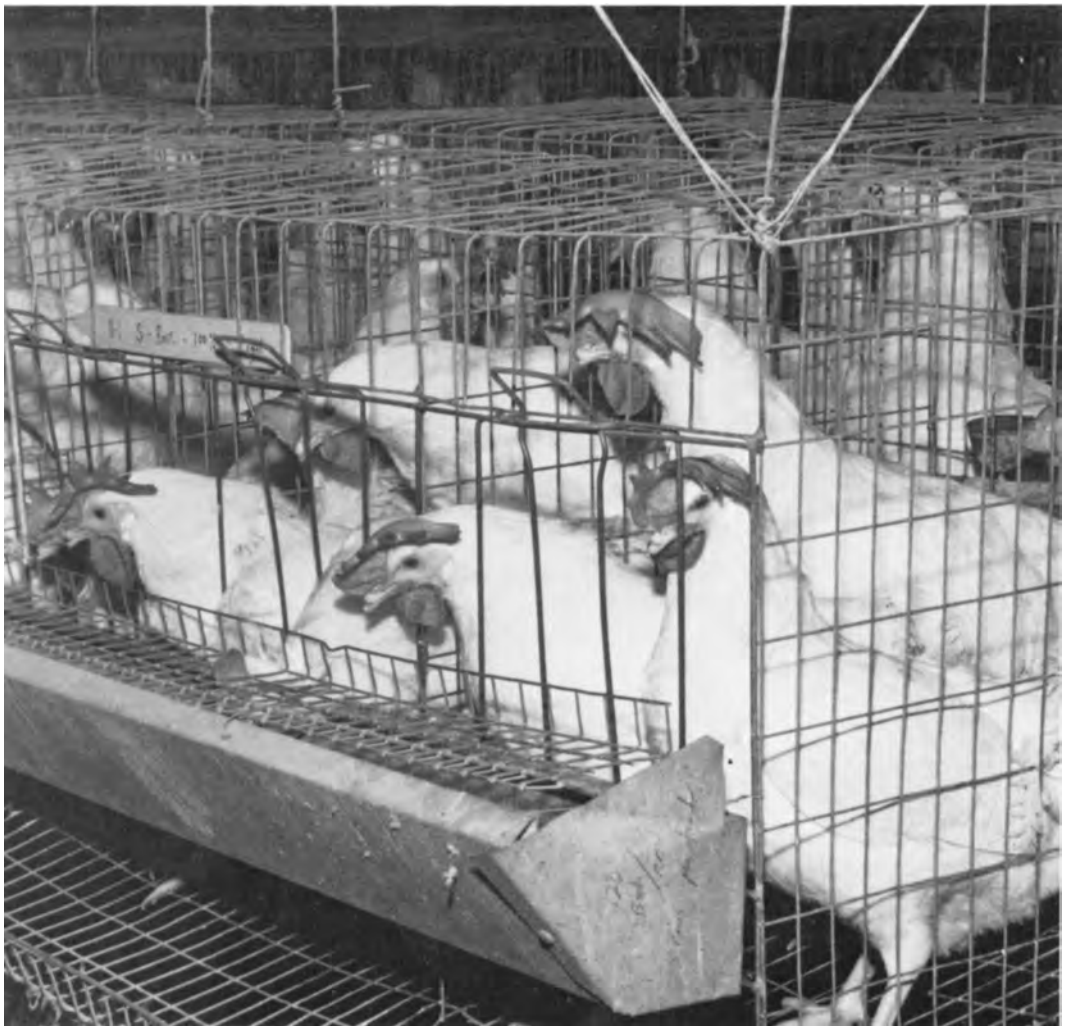

Welded wire trough lids block access to feed when closed.

# Late versus early initiation of controlled feeding of Leghorn layers

Douglas R. Kuney ☐ Milo H. Swanson

*Egg production dropped when controlled feeding was introduced to laying hens and other stress was observed.*

To improve feed efficiency without adversely affecting egg production, livability, and other production qualities, studies in controlled feeding of Leghorn laying hens are being conducted in Riverside and Orange counties. Results of other experiments reported by California Cooperative Extension and other researchers indicate that controlled feeding throughout the laying cycle can sometimes be economically beneficial. On the other hand, some researchers believe controlled feeding during the early stages of egg production may be too severe and may adversely affect production later in the lay cycle.

A previous test compared controlled feeding (by the time-limited feeding method) starting at 40 weeks of age versus 20 weeks of age. By delaying the controlled feeding program to 40 weeks of age, feed efficiency was improved over noncontrolled hens, but not without depressing egg production at the time the feeding control was applied. Furthermore, delayed groups failed to show production or economic improvement over groups that were controlled starting at 24 weeks of age. It was concluded that layers more readily adapt to controlled feeding with less stress at 24 weeks of age than at 40 weeks. It was also thought that stress may be caused by the method of control used, i.e., the sudden application of the time-limited feeding method.

This is a report on Orange County Feed Restriction Trial No. 5, conducted at the County Honor Farm in El Toro. The experiment was designed to minimize the stress of time-limited feeding initiated at 40 weeks of age by gradually limiting the eating time of the layers over several days. It was also designed to retest the effects of delaying controlled feeding until after peak production.

## Four treatments compared

The effects of four treatments were compared, using the Shaver strain of Leghorn. The four treatments included: (1) sudden restriction at 22 weeks of age; (2) sudden restriction at 40 weeks of age; (3) gradual restriction beginning at 40 weeks of age; and (4) free access throughout the entire lay cycle. Restrictions were accomplished by limiting the time hens had access to the feed trough to two 2-hour periods each day (6 to 8 a.m. and 6 to 8 p.m.). The gradual restriction was accomplished by decreasing access to feed troughs by 1-hour increments each day until the desired restriction was obtained. Because trough access was blocked on the first day of gradual restriction from 8 p.m. to 6 a.m., the gradual restriction process took 10 days to com-

plete. (A more detailed explanation of the mechanics of how feeding time was controlled can be found in *Progress in Poultry* (PIP), issue No. 11 (August 1978), from Cooperative Extension, University of California, Riverside, CA 92521.) The diet fed to all treatment groups was a standard lay mash formulated to contain 17 percent crude protein and 1260 kilocalories of metabolizable energy per pound of ration.

All controlled feeding groups consumed significantly less feed than the free access control birds (table 1). As expected, the group controlled starting at 22 weeks of age consumed less feed than those birds controlled from 40 weeks on. Regarding total protein and the essential amino acids lysine, methionine, and cystine, more than the required nutrient levels was achieved by birds under each of the controlled feeding programs (table 2). Egg production was depressed by all controlled feeding treatments (by 16 to 19 eggs per hen) over the 40-week experiment. No significant differences in mean eggs per hen housed were observed among controlled feeding methods.

Feed savings as a result of the controlled methods tested were offset by depressed egg production, resulting in no significant improvements in feed efficiency. It follows that the lack of improved efficiency prevented potential economic gain over the free access feeding method.

The experiment was further complicated by what was tentatively diagnosed as late Marek's disease. A characteristic drop in production was first observed at 34 weeks of age in all treatment groups. This was before initiation of the delayed controlled feeding treatments. Hen-housed mortality rose to approximately 2 percent per month. The birds with free access to feed suffered production losses near 12 percent; the losses were only partially regained within 8 weeks.

A drop in egg production was again observed when controlled feeding was implemented at 40 weeks of age. Efforts to minimize this drop by gradually imposing controlled feeding failed. It could not be determined whether the drop in production associated with the delayed treatment resulted from a stress caused by adjustment to the controlled feeding method, stress caused by late Marek's disease, or the combined effects of both. Since the group, placed on controlled feeding starting at 22 weeks, suffered a relatively severe production loss (compared with the free access control group), it appeared the controlled feeding method used imposed some additional "stress" unrelated to nutrient intake.

In summary, the controlled feeding method tested (time-limited feeding) apparently stressed the layers to the point where their ability to resist other stresses, such as disease, was impaired. It is believed that chickens, when subjected to controlled feeding by the time-limited method, tolerate adjustment better at a young age when production rates are low.

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**TABLE 1. Treatment Effects on Feed Consumption and Egg Production during 40 Weeks of Lay.**

| Treatment | Feed consumption | | Egg production | |
|---|---|---|---|---|
| | 1b/100 hens/day | lb/avg. hen | % hen day | eggs/hen housed |
| Free access | 25.7a* | 71.9* | 78.7a* | 195a* |
| 22-week sudden | 23.2c | 64.9c | 72.4b | 179b |
| 40-week sudden | 24.3b | 68.1b | 74.5b | 178b |
| 40-week gradual | 23.6bc | 66.2bc | 74.5b | 176b |

*Means within a column with different letters are significantly different ($P \leq 0.05$).

**TABLE 2. Average Nutrient Intakes throughout 40-Week Experiment.**

| Treatment | Protein | Lysine | Methionine + cystine | Metabolizable energy |
|---|---|---|---|---|
| | (g) | (mg)* | (mg)* | (Kcal) |
| Free access | 19.9 | 796 | 690 | 324 |
| 22-week sudden | 17.9 | 714 | 620 | 292 |
| 40-week sudden | 18.7 | 748 | 649 | 306 |
| 40-week gradual | 18.2 | 728 | 631 | 297 |

*Stated nutrient requirements for Leghorn layers are 660 mg lysine per hen per day and 550 mg methionine plus cystine per hen per day. *Nutrient Requirements of Poultry*, 7th ed., 1977. National Academy of Sciences, Washington, D.C.

# Spider mites and predators in San Joaquin Valley almond orchards

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***Natural enemies of spider mites can vary from orchard to orchard and from section to section in California.***

The naval orangeworm (NOW), *Amyelois transitella* (Walker), is a major insect pest in California almond orchards. Pesticides used to control NOW include Guthion (azinphosmethyl), Imidan (prolate), and Sevin (carbaryl). Growers fear that spider mite increases will occur after these chemical treatments, and Guthion apparently caused increases in European red mite *(Panonychus ulmi* Koch) populations in two almond orchards near Modesto during 1977, but no serious problems occurred after use of Sevin in adjacent blocks in these orchards.

The project reported here was undertaken to determine the types of spider mites, their predators, and their relative importance in southern San Joaquin Valley almond orchards, and to compare them with northern San Joaquin Valley orchards monitored during 1977. We also evaluated the effect of Sevin on Pacific spider mites and their predators in one of these southern almond orchards during 1978.

In 1978 almond orchards near Bakersfield, Blackwell's Corner, and Chowchilla were monitored for mites every two weeks