Corn or Barley for Laying Hens

feeding trials with laying hens indicate barley used as grain in ration is as efficient as corn

D. W. Peterson and Phyllis A. Zweigart

The so-called high-energy, or high-efficiency, rations for laying hens differ from the conventional rations chiefly in that their content of wheat milling by-products and of alfalfa meal has been reduced and corn is supplied as the principal or only grain.

Corn is relatively low in indigestible residue—for which the term crude-fiber serves as a rough, though inadequate, approximation. Barley is about three times as high as corn in crude-fiber and—on a per pound basis—is lower in energy content than corn. A ration formulated in the same manner as the high-energy ration but containing barley in place of corn would not be considered a high-energy ration.

Earlier studies at the California Agricultural Experiment Station showed that hens fed a ration consisting principally of barley did not differ in production from hens given a predominantly corn diet. However, reproductive disturbances were significantly higher on the corn ration.

In most studies, high-energy rations have been compared with conventional rations with considerable variation of five or six ingredients between the two rations. It is difficult to conclude that the only difference between the two rations is energy content. These comparisons usually show no difference in egg production between high corn and conventional rations although feed consumed per dozen eggs is less on the corn ration. In these terms the corn ration is more efficient but the true practical measure of ration efficiency is cost per dozen eggs. The ration that is less expensive and still maintains the same high rate of production is the more efficient.

Because of the above considerations and because barley is usually less expensive in California an experiment was designed to compare a high corn ration with an identical ration in which barley was substituted for corn.

Experiment

Three groups of seven-months-old Single Comb White Leghorn pullets—with 32 birds in each group—were used in the experiment. All pullets were offspring of a single sire and twelve dams. Full sisters were evenly distributed among the three groups on the basis of the previous month's egg production. The groups were then equally distributed with regard to position in the batteries, so the same number of birds in each experimental group were in the upper or lower tiers of cages and the same number facing north or south.

Daily egg production records were kept for each bird. The hens were weighed every four weeks and feed consumption determined at the same time. Egg weights and shell thicknesses were measured at four week intervals on all eggs produced during one week.

Rations Tested

Two all-mash rations were prepared with the compositions as shown in the lower table on this page. Diet I contained corn as the grain portion and Diet II contained barley. Half of the barley ration was made into pellets and was fed as Diet III. The three groups of hens were fed the rations for a period of 24 weeks beginning in November. All diets contained 15% protein. The corn diet gave an analysis of 3.4% fiber and the barley diet 5.9% fiber.

Results

During most of the experimental period the rate of egg production was approximately the same on all three diets but the over-all egg production was slightly higher on the pelleted barley ration. This difference cannot be consid-

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24-Week Feeding Trial
32 birds per group

Diet	% egg production for six 4-week periods						Average for 24 weeks
Corn	62	62	53	56	53	63	58.3%
Barley	62	51	51	64	58	66	58.8
Barley pellets	66	60	56	63	60	70	63.8

Average Values for 24 Weeks

	Corn	Barley	Barley pellets
Egg weight	56 grams	56 grams	56 grams
Shell thickness	0.33 mm*	0.33 mm	0.33 mm
Feed consumption per bird	40.6 lbs.	41.8 lbs.	44.4 lbs.
Lbs. feed/doz. eggs	4.94	5.08	4.97
Mortality	1 at 5 weeks	1 at 8 weeks	1 at 21 weeks
Body weight Start	1732 grams	1673 grams	1698 grams
End	1865 grams	1753 grams	1811 grams

* millimeters.

Composition of Rations Used

	Corn Ration Lbs. per 100 lbs.	Barley Ration Lbs. per 100 lbs.
Ground corn	68.0	
Ground barley	..	68.0
Special dehydrated alfalfa	5.0	5.0
Wheat bran	5.0	5.0
Fish meal	5.0	5.0
Soybean oil meal	7.5	7.5
Meat and bone scrap	1.5	1.5
Dried whey	1.5	1.5
Limestone	4.0	4.0
Steamed bonemeal	1.0	1.0
Salt	0.5	0.5
Manganese Sulfate	0.125	0.125
Vitamin mixture*	1.0	1.0
Choline chloride	0.04	

* Contains (per lb.) 33 grams A&D mixture (1500D-400A) 0.1 gram riboflavin, 0.8 gram niacin, 0.4 gram calcium pantothenate (diluted with grain).

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other copper applied—was not the primary russet-causing agent in this block.

In the third experimental block—of 302 trees, established to study the effectiveness of streptomycin dust in the control of fire blight—blossoming branches were bagged as in the other blocks. The third block received no copper dust, but streptomycin dust was applied in seven treatments—with the last on May 14.

Samples of both protected and exposed fruit from the streptomycin-treated block showed less russet than did the exposed fruit from the second—and adjacent—block which received one copper—the Bordeaux—spray or the first plot which received five dustings.

The fruit in the streptomycin-treated block was as free from russet as the average pears from the protected branches on the trees in the copper-treated blocks. Should streptomycin prove to be effective in the control of blight, it appears to show promise in reducing the incidence of russet.

Pears which developed on branches protected by bagging showed less russet than similar fruit on unprotected branches. This was the case in the check plot, where no copper was applied until after the bags were removed, as well as in the plot receiving five copper dustings. Therefore, it is apparent that some factor or factors other than copper was the primary cause of fruit russet.

Trials to determine the cause of russeting of Bartlett pears are to be continued.

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HENS

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ered significant, however. On the mash rations there was no difference in production between those hens fed barley and those fed corn. Egg weights and shell thickness were the same in all groups. On the basis of efficiency—pounds of feed per dozen eggs—all groups were the same.

A high corn ration appears to have no advantage over a high barley ration as far as egg production is concerned.

The chief factor influencing the choice of these grains in an all-mash ration would appear to be the cost of the grain.

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