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Some Effects of Low Protein Grower Diets at Two Energy Levels Fed With and Without Antibiotics on Subsequent Egg Production

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Numerous studies, including several at this station, have shown that layer-type pullets can tolerate diets as low as 10 to 12% protein during the growing period. In fact, subsequent reproductive performance of pullets reared on such diets has been just as good as that of pullets reared on diets of higher protein content. Other work has shown that use of low energy grower diets, i.e., 1800-2300 Calories of Metabolizable Energy per kilogram, have produced pullets capable of performing as well or better than those reared on higher energy diets, 2800-3100 Cal./kilogram. Layer house mortality has generally been lower for pullets grown on the lower energy diets. However, the low energy fed pullets require much more feed, the relative proportions are in inverse relationship to the energy level of the diet. Consequently, pullet growers have generally not used low energy feeds extensively, i.e., oats or barley with hulls or other fiber sources vs. corn or milo as the cereal portion. This study evaluated two energy levels with and without an antibiotic. Antibiotics have not been shown to be of value for this period of growth on higher energy feeds. But, with low energy feeds, we have little or no information as to their potential value.

Sixty 8-week old pullets of each of three commercial strains of layer-type chickens were placed into each of 12 floor pens using corn-cob litter. They had been grown on the high energy, corn-soybean starter diet described by Carlson and Bonzer (1970, Fact Sheet 502). Two grower diets were formulated to contain 10% protein and 1950 Calories (M.E./kg) or 12% protein and 2900 Calories. Each was fed with and without 22 ppm each of Neomycin and Terramycin. Each diet was fed to three pens of pullets. At 21 weeks of age representative pullets of each strain and treatment were placed in laying cages and fed layer diets of 16 or 18% protein. Pullets of two strains were also fed a 14% protein diet supplemented with methionine.

The results shown in Table 1 indicate that the grower diets elicited no difference as to subsequent reproductive performance. Data not shown indicated that the pullets grown on the 10% low energy diet were a bit slower in coming into production. However, after two periods there were no differences. Omitting the first period, when egg size was so small that marketable eggs were not produced, showed that overall performance was excellent and markedly uniform. Strain one came into production at a much more rapid rate than the other two strains, but in subsequent periods strain two outproduced the others and essentially laid as many total eggs as strain one. However, the strain two eggs were smaller. The very low mortality of strain one and the rather high mortality of strain three would be significant if confirmed.

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[1]Former Superintendent; Superintendent, Poultry Research Center and Professor and Leader, Poultry Research and Extension, respectively.

Even during the period of peak performance, there was no effect of grower diets as shown in Table 2. The data shown for strain performance indicate that strain two performed best on the 16% protein diet. Its smaller egg size at that period might be of some concern. The effect of protein in the layer diet on egg size is consistent with previous reports. Egg size on the 14% protein and methionine diet was about adequate, and overall performance was equal to that of hens fed the other diets.

These results indicate that there were no differences in subsequent performance obtained from the grower diets used. A study is now under way in which each of these strains and grower diets are being used again to check these results.

Table 1. Performance of Laying Hens as Influenced by Grower Diet and Strain[1]

Treatment	Hen-day Production[2]	Feed per Dozen	Egg weight	Mortality
	%	kg	gm	%
Grower Diet[3]				
10-1950	70.4 (78.8)[4]	2.2 (1.5)	57.1 (58.4)	5.6
10-1950+	70.9 (78.5)	2.3 (1.5)	57.4 (58.7)	10.2
12-2900	71.8 (78.8)	2.0 (1.5)	56.4 (57.7)	8.3
12-2900+	70.4 (77.5)	2.1 (1.5)	57.1 (58.4)	7.4
Strain				
1	72.6 (78.6)	1.8 (1.6)	58.0 (59.3)	1.4
2	71.3 (79.4)	2.2 (1.5)	55.9 (57.1)	6.9
3	68.9 (76.8)	2.3 (1.5)	57.2 (58.6)	15.3

[1]All hens on a similar 16% layer diet.
[2]Eight 28-day periods starting at 22 weeks of age with 36 pullets of each strain that had been fed each grower diet.
[3]10-1950 = 10% protein, 1950 Cal. of M.E./kg.
10-1950+ = 22 ppm Neomycin and Terramycin.
12-2900 = 12% protein, 2900 Cal. of M.E./kg.
[4]Numbers in parenthesis are data obtained by omitting the first period.

Table 2. Performance of Laying Hens at Peak Production as Influenced by Grower Diet, Strain and Layer Diet

Treatment	Hen-day production	Feed per dozen	Egg weight	Mortality
	%	kg	gm	%
Grower Diets				
	Hens on 16% protein			
10-1950	81.9	1.4	55.2	0.9
10-1950+	80.5	1.5	55.7	1.9
12-2900	82.8	1.4	54.7	4.6
12-2900+	81.6	1.4	55.4	1.9
	Hens on 18% protein			
10-1950	81.4	1.5	57.6	0.3
10-1950+	81.2	1.5	57.4	0.6
12-2900	80.6	1.6	57.1	3.4
12-2900+	80.9	1.5	57.0	2.9
Strain				
	Hens on 16% protein			
1	80.9	1.5	56.1	0.7
2	84.5	1.4	54.4	2.1
3	79.7	1.4	55.3	4.2
	Hens on 18% protein			
1	81.0	1.6	58.1	0.2
2	80.7	1.5	56.1	2.8
3	81.4	1.5	57.7	2.4
	Hens on 14% protein and methionine			
2	79.4	1.4	55.1	5.3
3	80.5	1.4	55.6	2.8