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Amino Acid Additions to a 12% Protein Corn-Soy Diet for Layers

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Earlier studies at this station have indicated that, when a 16% protein, corn-soybean meal diet is diluted to 10.8% protein with glucose and supplemented with 0.15% DL-methionine, 0.19% L-lysine, 0.2% DL-isoleucine and 0.04% DL-tryptophan, 71% egg production was obtained. However, the following supplements were without further effects--0.1% DL-threonine and 0.05% DL-valine with 0.25 and 0.5% glycine alone and in all combinations or with glycine and glutamic acid each at 0.25, 0.5 and 1% levels.

Studies to be reported here were based on a 12% protein, largely corn diet with additions of 0.15% DL-methionine, 0.2% L-lysine, 0.05% L-tryptophan and 0.4% DL-isoleucine. Twenty-four-week old Babcock 300 pullets were randomly assigned each dietary treatment. One treatment consisted of the 12% protein diet plus 0.15% DL-methionine. The other three amino acids were added as cumulative supplements to the first diet as indicated in Table 1. Each treatment and the basal were fed to six replicates using six hens per replication. Comparisons of these treatments were also made with hens fed the standard 16% protein diet.

The data in Table 1 present the average performance for a period of 7 months. As shown in this table, methionine and the combination of methionine-lysine supplements depressed egg production. On the other hand, the improved egg production from hens on treatment 4 over those on treatment 3 is probably a good indication of the superiority of amino acid balance for this treatment.

It is apparent from Table 1 that feed efficiency was decreased as a result of the methionine and methionine-lysine additions. This follows almost the same trend that was observed for percent egg production. Hens on the 16% protein diet were most efficient, indicating a need for further amino acid supplements for the 12% protein diet.

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Table 1. Effect of Amino Acid Supplementation of a 12 Percent Corn Diet for Layers

Treatment	Egg production hen-day ¹ %	Grams of egg per gram of feed	Feed efficiency (kg feed per dozen eggs)
1. 12% protein basal ²	74.2	0.412	1.74
2. As 1 + 0.15% DL-methionine	71.7	0.395	1.84
3. As 2 + 0.2% L-lysine	69.3	0.394	1.85
4. As 3 + 0.05% L-tryptophan	76.2	0.419	1.73
5. As 4 + 0.4% DL-isoleucine	73.8	0.419	1.75
6. 16% protein ²	78.4	0.451	1.61

¹Average for seven 28-day periods.

²Contained as follows:

	12% protein	16% protein
Corn	82	71
Soybean meal (48.5%)	9	20
Alfalfa meal	2	2
Dicalcium phosphate	1.5	1.5
Salt	0.5	0.5
Limestone	5.0	5.0
Vitamin mix	0.5	0.5