

Protein and Arginine Levels in Chick Diets. (17603)

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A further investigation was conducted on the arginine requirement of the growing chick, particularly as affected by protein level. Diets used and procedures followed were very similar to those recently described(1) and need not be given in detail. In the present case, all diets contained 5% of dehydrated alfalfa meal and sufficient of a good grade of commercial casein to furnish the desired protein levels as determined by analysis. In addition to all known vitamins and minerals, necessary quantities of glycine, methionine, and animal protein factors* were added. The arginine content of the casein and alfalfa protein was taken as 4.0% of the crude protein ($\%N \times 6.25$).

The results are given in Table I. It is evident that in this case, as well as in the previous methionine(1) and lysine(2) studies, the indispensable amino acid requirement (chick) increases with the protein level in the diet. As a per cent of the protein, the arginine requirement is not more than 6% at each protein level. At each level of pro-

tein, the next amount of arginine below 6% of the protein appears less than optimal. As closely as the data can be interpreted, the arginine requirement is a practically constant proportion of the protein.

In agreement with the former report,(1) the highest protein level supported the highest growth rate, although the chicks were somewhat older in the present work. In a previous review,(3) the arginine level for optimal growth was indicated as 1.2% of the diet, at approximately 20% of protein in the diet. This indication is supported by the present data. The general discussion of results in a former publication(1) applies to the present report, as well.

Summary, The arginine requirement of the chick was estimated in relation to the protein level in the diet, from 15 to 30%. The requirement was found to be approximately 6% of the total protein in the diet, at each level of protein.

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TABLE I.
Relation of Protein and Arginine Levels to the Rate of Gain of Chicks.

Protein in diet, %	Arginine added to diet, %	Total arginine in diet, %	Arginine in protein, %	Daily rate of gain, %
15	0.0	.6	4.00	5.38
15	.1	.7	4.67	5.48
15	.2	.8	5.33	5.68
15	.3	.9	6.00	5.86
15	.4	1.0	6.67	5.75
20	0.0	.8	4	5.97
20	.2	1.0	5	6.14
20	.4	1.2	6	6.39
20	.6	1.4	7	6.40
20	.8	1.6	8	6.41
30	0.0	1.2	4	6.38
30	.3	1.5	5	6.67
30	.6	1.8	6	6.95
30	.9	2.1	7	6.90
30	1.2	2.4	8	6.96

Conducted with selected Barred Rock-New Hampshire cross chicks about 4 weeks old and kept on experimental diets for 10 days. 8 chicks per group.

1. Almquist, H. J., *Proc. Soc. Exp. Biol. and Med.*, 1949, v72, 179.

* Experimental preparation N 199 B, Lederle

Laboratories. Kindly provided by Dr. T. H. Jukes.

2. Grau, C. R., *J. Nutrition*, 1948, v36, 99.

3. Almquist, H. J., *J. Nutrition*, 1947, v34, 543.