

Amino Acid Requirement for poultry

The needs of poultry from amino acids based on the individual needs of birds for the purposes of maintenance, mean growth rate and egg production. We can be use coefficients or the values in Table (1) to estimating the needs of the bird of lysine as well as the amino acids methionine + cystine. And depending on the amounts of these amino acids and using the values in table (2) the other amino acids are estimated.

Table -1. Coefficients for calculating the requirement of two limiting amino acids.

Amino acid	Laying domestic fowl		Broiler chickens		Turkeys	
	a	b	a	b	a	b
Lysine	9.99	73	14.86	82	21.16	19
Methionine plus cystine	10.15	13	11.59	41	11.28	98

$$\text{Amino acid required (mg day}^{-1}\text{)} = a \times \text{productive output (g day}^{-1}\text{)} + b \times \text{live weight (kg)}$$

Table .2. The ideal balance of amino acids for poultry (relative to lysine = 1.00).

Amino acid	Domestic fowl			
	Growing flocks	Egg laying flocks	Growing turkeys	Growing ducks
Lysine	1.00	1.00	1.00	1.00
Arginine	1.05	1.06	1.10	1.00
Glycine and serine	1.31	0.78	1.27	1.27
Histidine	0.40	0.25	0.38	0.43
Isoleucine	0.72	0.78	0.69	0.77
Leucine	1.25	1.14	1.16	1.30
Methionine and cystine	0.75	0.86	0.75	0.75
Phenylalanine and tyrosine	1.21	1.25	1.08	1.20
Threonine	0.63	0.69	0.68	0.66
Tryptophan	0.18	0.24	0.17	0.19
Valine	0.79	0.87	0.76	0.89

1. Amino acid required (mg/day) = a × productive output (g/d) + b × live weight (kg)
2. Productive output (g/d) = Mean growth rate (g)+(1.3 × SD)
3. Productive output (g/d) = Egg weight (g) + (1.6 × SD)
4. Lysine level in the feed (g per kg feed) = Amino acid required (mg/day)/Feed intake (g)
5. Methionine + cystine in the feed (g per kg feed) = Amino acid required (mg/day)/Feed intake (g)

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Lysine level in the feed (g per kg feed) = (Methionine and cystine/ ideal balance of Methionine and cystine)

6. The other AA level in the feed (g per kg feed) = lysine level (g per kg feed) × the ideal balance of AA for the bird

- ▶ Broiler flock, four weeks old the average of birds weight 1.3 kg with daily growth rate 85 g , standard deviation 4.7 g. and daily consumption of feed 125 g . Calculate the bird's need of lysine and histidine
- ▶ Flock of Chicken to egg production, the weight rate 2200 g/ bird. The average weight of the produced eggs 61.2 g with a standard deviation 5.12 g ,daily growth rate 10 g and a standard deviation 0.21g with daily feed intake 120g. Calculate bird's need of Lysine, Histidine, Leucine, tyrosine, Theronine and Valine.
- ▶ Flock to egg production, the weight rate 2.05 kg. The average weight of the eggs 58.7 g with a standard deviation 4.18 g and daily consumption of feed 114 g. Calculate bird's need of methionine + cystine and histidine.
- ▶ Turkey flock 10 weeks old average weight of birds 3.78 kg with daily growth rate 86 g and a standard deviation 9.2 g. Calculate birds need for lysine, arginine and tryptophan if you know that daily feed consumption 170 gram.