

Nutrient Requirements of Chickens and Turkeys

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Tables from *Nutrient Requirements of Poultry*, 8th revised edition, 1984, National Academy Press, 2101 Constitution Ave., N.W. Washington, DC 20418. Estimated values are indicated in **bold** to distinguish them from the established requirements shown in Roman type.

Conversion chart: 454 grams/lb; 1,000 grams/kilogram; 2.2 lbs./kilogram

Table 1. Body weights and feed requirements of broilers¹ (table is split into two parts).

Age (weeks)	Body weights (g)		Weekly feed consumption (g)	
	M	F	M	F
1	130	120	120	110
2	320	300	260	240
3	560	515	390	355
4	860	790	535	500
5	1,250	1,110	740	645
6	1,690	1,430	980	800
7	2,100	1,745	1,095	910
8	2,520	2,060	1,210	970
9	2,925	2,350	1,320	1,010

¹Typical for broilers fed well-balanced diets containing 3,200 ME kcal/kg

Table 1. Body weights and feed requirements of broilers¹ (continued).

Age (weeks)	Cumulative feed consumption (g)		Weekly energy consumption (ME kcal/bird)		Cumulative energy consumption (ME kcal/bird)	
	M	F	M	F	M	F
1	120	110	385	350	385	350
2	380	350	830	770	1,215	1,120
3	770	705	1,250	1,135	2,465	2,255
4	1,305	1,205	1,710	1,600	4,175	3,855
5	2,045	1,850	2,370	2,065	6,545	5,920
6	3,025	2,650	3,135	2,560	9,680	8,480
7	4,120	3,560	3,505	2,910	13,185	11,390
8	5,330	4,530	3,870	3,105	17,055	14,495
9	6,650	5,540	4,225	3,230	21,280	17,725

¹Typical for broilers fed well-balanced diets containing 3,200 ME kcal/kg

Conversion chart: 454 grams/lb; 1,000 grams/kilogram; 2.2 lbs./kilogram

Table 2. Nutrient requirements of leghorn-type chickens as percentages or as milligrams or units per kilogram of diet (table is split into two parts).

Energy base kcal ME/kg diet ¹	Growing 0-6 weeks 2,900	Growing 6-14 weeks 2,900	Growing 14-20 weeks 2,900
Protein (%)	18	15	12
Arginine (%)	1.00	0.83	0.67
Glycine and serine (%)	0.70	0.58	0.47
Histidine (%)	0.26	0.22	0.17
Isoleucine (%)	0.60	0.50	0.40
Leucine (%)	1.00	0.83	0.67

Lysine (%)	0.85	0.60	0.45
Methionine + cystine (%)	0.60	0.50	0.40
Methionine (%)	0.30	0.25	0.20
Phenylalanine + tyrosine (%)	1.00	0.83	0.67
Phenylalanine (%)	0.54	0.45	0.36
Threonine (%)	0.68	0.57	0.37
Tryptophan (%)	0.17	0.14	0.11
Valine (%)	0.62	0.52	0.41
Linoleic acid (%)	1.00	1.00	1.00
Calcium (%)	0.80	0.70	0.60
Phosphorus, available (%)	0.40	0.35	0.30
Potassium (%)	0.40	0.30	0.25
Sodium (%)	0.15	0.15	0.15
Chlorine (%)	0.15	0.12	0.12
Magnesium (mg)	600	500	400
Manganese (mg)	60	30	30
Zinc (mg)	40	35	35
Iron (mg)	80	60	60
Copper (mg)	8	6	6
Iodine (mg)	0.35	0.35	0.35
Selenium (mg)	0.15	0.10	0.10
Vitamin A (IU)	1,500	1,500	1,500
Vitamin D (ICU)	200	200	200

Vitamin E (IU)	10	5	5
Vitamin K (mg)	0.50	0.50	0.50
Riboflavin (mg)	3.60	1.80	1.80
Pantothenic acid (mg)	10.0	10.0	10.0
Niacin (mg)	27.0	11.0	11.0
Vitamin B ₁₂ (mg)	0.009	0.003	0.003
Choline (mg)	1,300	900	500
Biotin (mg)	0.15	0.10	0.10
Folacin (mg)	0.55	0.25	0.25
Thiamin (mg)	1.8	1.3	1.3
Pyridoxine (mg)	3.0	3.0	3.0

¹These are typical dietary energy concentrations.

²Assumes an average daily intake of 110 g of feed/hen daily.

Table 2. Nutrient requirements of leghorn-type chickens as percentages or as milligrams or units per kilogram of diet (continued).

Energy base kcal ME/kg diet ¹	Laying 2,900	Laying, daily intake per hen (mg) ²	Breeding 2,900
Protein (%)	14.5	16,000	14.5
Arginine (%)	0.68	750	0.68
Glycine and serine (%)	0.50	550	0.50
Histidine (%)	0.16	180	0.16
Isoleucine (%)	0.50	550	0.50
Leucine (%)	0.73	800	0.73
Lysine (%)	0.64	700	0.64
Methionine + cystine (%)	0.55	600	0.55

Methionine (%)	0.32	350	0.32
Phenylalanine + tyrosine (%)	0.80	880	0.80
Phenylalanine (%)	0.40	440	0.40
Threonine (%)	0.45	500	0.45
Tryptophan (%)	0.14	150	0.14
Valine (%)	0.55	600	0.55
Linoleic acid (%)	1.00	1,100	1.00
Calcium (%)	3.40	3,750	3.40
Phosphorus, available (%)	0.32	350	0.32
Potassium (%)	0.15	165	0.15
Sodium (%)	0.15	165	0.15
Chlorine (%)	0.15	165	0.15
Magnesium (mg)	500	55	500
Manganese (mg)	30	3.30	60
Zinc (mg)	50	5.50	65
Iron (mg)	50	5.50	60
Copper (mg)	6	0.88	8
Iodine (mg)	0.30	0.03	0.30
Selenium (mg)	0.10	0.01	0.10
Vitamin A (IU)	4,000	440	4,000
Vitamin D (ICU)	500	55	500
Vitamin E (IU)	5	0.55	10
Vitamin K (mg)	0.50	0.055	0.50

Riboflavin (mg)	2.20	0.242	3.80
Pantothenic acid (mg)	2.20	0.242	10.0
Niacin (mg)	10.0	1.10	10.0
Vitamin B ₁₂ (mg)	0.004	0.00044	0.004
Choline (mg)	?	?	?
Biotin (mg)	0.10	0.011	0.15
Folacin (mg)	0.25	0.0275	0.35
Thiamin (mg)	0.80	0.088	0.80
Pyridoxine (mg)	3.0	0.33	4.50

¹These are typical dietary energy concentrations.

²Assumes an average daily intake of 110 g of feed/hen daily.

Table 3. Body weights and feed requirements of leghorn-type pullets and hens.

Age (weeks)	Body weight ¹ (g)	Feed consumption ² (g/week)	Typical egg production (hen-day %)
0	35	45	—
2	135	90	—
4	270	180	—
6	450	260	—
8	620	325	—
10	790	385	—
12	950	430	—
14	1,060	460	—
16	1,160	460	—
18	1,260	460	—

20	1,360	460	—
22	1,425	525	10
24	1,500	595	38
26	1,575	665	64
30	1,725	770	88
40	1,815	770	80
50	1,870	765	74
60	1,900	755	68
70	1,900	740	62

¹Pullets and hens of Leghorn-type strains are generally fed ad libitum but are occasionally control-fed to limit body weights. Values shown are typical but will vary with strain differences, season and lighting. Specific breeder guidelines should be consulted for desired schedules of weights and feed consumption.

²Based on diets containing 2,900 ME kcal/kg, consumption will vary depending upon the caloric density of the diet, environmental temperature and rate of production.

Table 4. Nutrient requirements of broilers as percentages or as milligrams or units per kilogram of diet.

Energy base kcal ME/kg diet ¹	Weeks 0-3 3,200	Weeks 3-6 3,200	Weeks 6-8 3,200
Protein (%)	23.0	20.0	18.0
Arginine (%)	1.44	1.20	1.00
Glycine + Serine (%)	1.50	1.00	0.70
Histidine (%)	0.35	0.30	0.26
Isoleucine (%)	0.80	0.70	0.60
Leucine (%)	1.35	1.18	1.00
Lysine (%)	1.20	1.00	0.85

Methionine + Cystine (%)	0.93	0.72	0.60
Methionine (%)	0.50	0.38	0.32
Phenylalanine + Tyrosine (%)	1.34	1.17	1.00
Phenylalanine (%)	0.72	0.63	0.54
Threonine (%)	0.80	0.74	0.68
Tryptophan (%)	0.23	0.18	0.17
Valine (%)	0.82	0.72	0.62
Linoleic acid (%)	1.00	1.00	1.00
Calcium (%)	1.00	0.90	0.80
Phosphorus, available (%)	0.45	0.40	0.35
Potassium (%)	0.40	0.35	0.30
Sodium (%)	0.15	0.15	0.15
Chlorine (%)	0.15	0.15	0.15
Magnesium (mg)	600	600	600
Manganese (mg)	60.0	60.0	60.0
Zinc (mg)	40.0	40.0	40.0
Iron (mg)	80.0	80.0	80.0
Copper (mg)	8.0	8.0	8.0
Iodine (mg)	0.35	0.35	0.35
Selenium (mg)	0.15	0.15	0.15
Vitamin A (IU)	1,500	1,500	1,500
Vitamin D (ICU)	200	200	200
Vitamin E (IU)	10	10	10
Vitamin K (mg)	0.50	0.50	0.50

Riboflavin (mg)	3.60	3.60	3.60
Pantothenic acid (mg)	10.0	10.0	10.0
Niacin (mg)	27.0	27.0	11.0
Vitamin B ₁₂ (mg)	0.009	0.009	0.003
Choline (mg)	1,300	850	500
Biotin (mg)	0.15	0.15	0.10
Folacin (mg)	0.55	0.55	0.25
Thiamin (mg)	1.80	1.80	1.80
Pyridoxine (mg)	3.0	3.0	2.5
¹ These are typical dietary energy concentrations.			

Table 5. Nutrient requirements of turkeys as percentages or as milligrams or units per kilogram of feed (table is split into two parts).

Energy base kcal ME/kg diet ¹	Age (weeks)			
	M: 0-4, F: 0-4 2,800	M: 4-8, F: 4-8 2,900	M: 8-12, F: 8-11 3,000	M: 12-16, F: 11-14 3,100
Protein (%)	28	26	22	19
Arginine (%)	1.6	1.5	1.25	1.1
Glycine + serine (%)	1.0	0.9	0.8	0.7
Histidine (%)	0.58	0.54	0.46	0.39
Isoleucine (%)	1.1	1.0	0.85	0.75
Leucine (%)	1.9	1.75	1.5	1.3
Lysine	1.6	1.5	1.3	1.0
Methionine +cystine (%)	1.05	0.9	0.75	0.65

Methionine (%)	0.53	0.45	0.38	0.33
Phenylalanine + tyrosine (%)	1.8	1.65	1.4	1.2
Phenylalanine (%)	1.0	0.9	0.8	0.7
Threonine (%)	1.0	0.93	0.79	0.68
Tryptophan (%)	0.26	0.24	0.2	0.18
Valine (%)	1.2	1.1	0.94	0.8
Linoleic acid (%)	1.0	1.0	0.8	0.8
Calcium (%)	1.2	1.0	0.85	0.75
Phosphorus, available (%)	0.6	0.5	0.42	0.38
Potassium (%)	0.7	0.6	0.5	0.5
Sodium (%)	0.17	0.15	0.12	0.12
Chlorine (%)	0.15	0.14	0.14	0.12
Magnesium (mg)	600	600	600	600
Manganese (mg)	60	60	60	60
Zinc (mg)	75	65	50	40
Iron (mg)	80	60	60	60
Copper (mg)	8	8	6	6
Iodine (mg)	0.4	0.4	0.4	0.4
Selenium (mg)	0.2	0.2	0.2	0.2
Vitamin A (IU)	4,000	4,000	4,000	4,000
Vitamin D ² (ICU)	900	900	900	900
Vitamin E (IU)	12	12	10	10
Vitamin K (mg)	1.0	1.0	0.8	0.8

Riboflavin (mg)	3.6	3.6	3.0	3.0
Pantothenic acid (mg)	11.0	11.0	9.0	9.0
Niacin (mg)	70.0	70.0	50.0	50.0
Vitamin B ₁₂ (mg)	0.003	0.003	0.003	0.003
Choline (mg)	1,900	1,600	1,300	1,100
Biotin (mg)	0.2	0.2	0.15	0.125
Folacin (mg)	1.0	1.0	0.8	0.8
Thiamin (mg)	2.0	2.0	2.0	2.0
Pyridoxine (mg)	4.5	4.5	3.5	3.5

¹These are typical ME concentrations for corn-soy diets. Different ME values may be appropriate if other ingredients predominate.

²These concentrations of vitamin D are satisfactory when the dietary concentrations of calcium and available phosphorus conform with those in this table.

Table 5. Nutrient requirements of turkeys as percentages or as milligrams or units per kilogram of feed (continued).

Energy base kcal ME/kg diet ¹	Age (weeks)			
	M: 16-20, F: 14-17 3,200	M: 20-24, F: 17-20 3,300	Holding 2,900	Breeding hens 2,900
Protein (%)	16.5	14	12	14
Arginine (%)	0.95	0.8	0.6	0.6
Glycine + serine (%)	0.6	0.5	0.4	0.5
Histidine (%)	0.35	0.29	0.25	0.3
Isoleucine (%)	0.65	0.55	0.45	0.5
Leucine (%)	1.1	0.95	0.5	0.5
Lysine	0.8	0.65	0.5	0.6

Methionine + cystine (%)	0.55	0.45	0.4	0.4
Methionine (%)	0.28	0.23	0.2	0.2
Phenylalanine + tyrosine (%)	1.05	0.9	0.8	1.0
Phenylalanine (%)	0.6	0.5	0.4	0.55
Threonine (%)	0.59	0.5	0.4	0.45
Tryptophan (%)	0.15	0.13	0.1	0.13
Valine (%)	0.7	0.6	0.5	0.58
Linoleic acid (%)	0.8	0.8	0.8	1.0
Calcium (%)	0.65	0.55	0.5	2.25
Phosphorus, available (%)	0.32	0.28	0.25	0.35
Potassium (%)	0.4	0.4	0.4	0.6
Sodium (%)	0.12	0.12	0.12	0.15
Chlorine (%)	0.12	0.12	0.12	0.12
Magnesium (mg)	600	600	600	600
Manganese (mg)	60	60	60	60
Zinc (mg)	40	40	40	65
Iron (mg)	50	50	50	60
Copper (mg)	6	6	6	8
Iodine (mg)	0.4	0.4	0.4	0.4
Selenium (mg)	0.2	0.2	0.2	0.2
Vitamin A (IU)	4,000	4,000	4,000	4,000
Vitamin D ² (ICU)	900	900	900	900
Vitamin E (IU)	10	10	10	25

Vitamin K (mg)	0.8	0.8	0.8	1.0
Riboflavin (mg)	2.5	2.5	2.5	4.0
Pantothenic acid (mg)	9.0	9.0	9.0	16.0
Niacin (mg)	40.0	40.0	40.0	30.0
Vitamin B ₁₂ (mg)	0.003	0.003	0.003	0.003
Choline (mg)	950	800	800	1,000
Biotin (mg)	0.100	0.100	0.100	0.15
Folacin (mg)	0.7	0.7	0.7	1.0
Thiamin (mg)	2.0	2.0	2.0	2.0
Pyridoxine (mg)	3.0	3.0	3.0	4.0

¹These are typical ME concentrations for corn-soy diets. Different ME values may be appropriate if other ingredients predominate.
These concentrations of vitamin D are satisfactory when the dietary concentrations of calcium and available phosphorus conform with those in this table.

Table 6. Growth rate, feed and energy consumption of large-type turkeys (table is split into two parts).

Age (weeks)	Body weight		Feed consumption per week		Cumulative feed consumption	
	(kg): M	(kg): F	(kg): M	(kg): F	(kg): M	(kg): F
1	0.11	0.11	0.10	0.10	0.10	0.10
2	0.27	0.24	0.20	0.17	0.30	0.27
3	0.58	0.47	0.45	0.39	0.75	0.66
4	1.0	0.70	0.61	0.46	1.36	1.12
5	1.5	1.1	0.70	0.60	2.06	1.72
6	2.0	1.6	0.86	0.76	2.92	2.48
7	2.6	2.1	1.08	0.89	4.00	3.37

8	3.3	2.6	1.30	1.04	5.30	4.41
9	4.0	3.1	1.51	1.18	6.81	5.59
10	4.7	3.7	1.78	1.34	8.59	6.93
11	5.5	4.3	1.99	1.47	10.58	8.40
12	6.3	4.8	2.25	1.59	12.83	9.99
13	7.1	5.3	2.51	1.70	15.34	11.69
14	8.0	5.8	2.66	1.75	18.00	13.44
15	8.8	6.3	2.89	1.82	20.89	15.26
16	9.7	6.7	3.05	1.92	23.94	17.18
17	10.5	7.1	3.13	2.03	27.03	19.21
18	11.3	7.5	3.27	2.07	30.34	21.28
19	12.1	7.8	3.43	2.15	33.77	23.43
20	12.8	8.1	3.60	2.23	37.37	25.66
21	13.5	—	3.71	—	41.08	—
22	14.2	—	3.82	—	44.90	—
23	14.8	—	3.94	—	48.84	—
24	15.4	—	4.05	—	52.89	—

Table 6. Growth rate, feed and energy consumption of large-type turkeys (continued).

Age (weeks)	Body weight		ME consumption per week	
	(kg): M	(kg): F	(Mcal): M	(Mcal): F
1	0.11	0.11	0.30	0.30
2	0.27	0.24	0.60	0.50
3	0.58	0.47	1.1	0.80

4	1.0	0.70	1.7	1.2
5	1.5	1.1	2.3	1.6
6	2.0	1.6	2.9	2.1
7	2.6	2.1	3.5	2.6
8	3.3	2.6	4.1	3.1
9	4.0	3.1	4.8	3.6
10	4.7	3.7	5.2	4.1
11	5.5	4.3	5.7	4.6
12	6.3	4.8	6.3	5.1
13	7.1	5.3	7.1	5.5
14	8.0	5.8	7.8	5.8
15	8.8	6.3	8.4	6.1
16	9.7	6.7	8.8	6.4
17	10.5	7.1	9.6	6.7
18	11.3	7.5	10.2	6.9
19	12.1	7.8	10.9	7.1
20	12.8	8.1	11.6	7.3
21	13.5	—	12.5	—
22	14.2	—	12.9	—
23	14.8	—	13.2	—
24	15.4	—	13.5	—

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