

# GUIDE

from North Carolina State University at Raleigh / Extension Poultry Science

## VITAMINS FOR POULTRY

Vitamins play an important role in several metabolic and physiological processes in poultry. Given below is a very brief description of the functions each vitamin performs.

**Vitamin A** is necessary for good feathering, egg production and good growth. It is also required for reproduction and the health of the lining of the respiratory and digestive tracts.

**Vitamin D<sub>3</sub>** is necessary for proper utilization of calcium and phosphorus which in turn is important in bone growth and egg shell production. Rickets are the result of a Vitamin D<sub>3</sub> deficiency.

**Vitamin E** is required for normal fertility and reproduction. It helps to prevent muscular dystrophy and spares selenium. It also serves as an antioxidant in feeds and is involved in sulfur amino acid metabolism.

**Choline** is necessary for the prevention of perosis in chickens and turkeys. It is known as a "methyl" donor and can, therefore, transform homocystine to methionine, an important amino acid for poultry. It is also involved in fat metabolism and as a result it is believed to be involved in the prevention of the fatty liver syndrome in poultry.

**Vitamin B<sub>12</sub>** is necessary for good growth and good hatchability. A deficiency may cause pernicious anemia.

**Folic Acid** is involved in the prevention of pernicious anemia. Folic Acid also helps to prevent perosis and promotes good feathering.

**Pyridoxine** is required in the metabolism of carbohydrates, fats and minerals. Deficient birds be-

come nervous, have a poor appetite and walk with a jerky motion.

**Vitamin K** is required for the blood to clot normally. Vitamin K deficient birds may exhibit hemorrhagic blemishes in the muscle meat, but this condition may also be caused by other things such as aflatoxins.

**Riboflavin** functions in many enzyme systems in the body. A deficiency of riboflavin affects the tissues of nerves, the most noticeable of which is the sciatic nerve. If the sciatic nerve is affected, birds will have "curled-toe" paralysis.

**d-Pantothenic Acid** is essential for growth, hatchability and feathering. A deficiency may cause scabs on the mouth, vent and around the eyes. It is also involved in carbohydrate, fat and amino acid metabolism. Deficiency symptoms are similar to biotin deficiency symptoms.

**Niacin** or nicotinic acid is involved in enzymes that function in the metabolism of fats, protein and carbohydrates. Enlarged hocks and bow legs similar to perosis may develop on a niacin deficient diet.

**Thiamine** deficient diets cause paralysis in baby chicks with legs extended and head retracted. The genital organs atrophy over a long period of time. Appetite is depressed if the deficiency is severe enough.

**Biotin** deficiencies are similar to pantothenic acid deficiencies, and it may also produce perosis. In breeder birds a decrease in hatchability may occur while in young birds, especially turkeys, the bottoms of the feet may crack and become inflamed. Scabs may also appear in the corner of the mouth and on the eyelids. The same symptoms may occur on pullets grown in cages.

Suggested levels of vitamins to be added per ton of finished feed for commercial layers

	Pullet Starter	Pullet Grower	Layer
Vitamin A, I.U.	6,000,000	5,000,000	5,000,000
Vitamin D <sub>3</sub> , I.C.U.	1,500,000	1,500,000	2,000,000
Vitamin E, I.U.	4,000	3,000	4,000
Riboflavin, gms	5	4	4
d-Pantothenic Acid, gms	10	8	8
Niacin, gms	30	20	20
Vitamin B <sub>12</sub> , mgs	8	6	8
Choline Chloride, gms	300	300	400
Vitamin K Activity, gms	1	1	1
Folic Acid, mgs	500	300	200
Pyridoxine Hydrochloride, mgs			2
Biotin, mg	10	10	

**Suggested levels of vitamins to be added per ton of finished feed for broilers and broiler breeders**

	Starter	Grower	Withdrawal	Breeder
Vitamin A, I.U.	6,000,000	6,000,000	2,000,000	8,000,000
Vitamin D <sub>3</sub> , I.C.U.	3,000,000	3,000,000	1,000,000	4,000,000
Vitamin E, I.U.	5,000	5,000	1,000	10,000
Riboflavin, gms	8	6	4	6
d-Pantothenic Acid	12	10	6	12
Niacin, gms	40	30	20	30
Choline, Chloride, gms	600	600	400	500
Vitamin B <sub>12</sub> , mgs	12	10	6	10
Vitamin K Activity, gms	2	2	2	2
Folic Acid, mgs	1,000	1,000		1,000
Thiamine, gms	1	1		0.5
Biotin, mgs	10			25
Pyridoxine Hydrochloride, gms	2	2		2

**Suggested levels of vitamins to be added per ton of finished feed for turkeys**

Type of Premix**	Turkey Feed Number*				
	1	2	3	4	5
Vitamin A, I.U.	12,000,000	9,000,000	7,000,000	5,000,000	10,000,000
Vitamin D <sub>3</sub> , I.C.U.	4,000,000	4,000,000	3,000,000	2,500,000	4,000,000
Vitamin E, I.U.	15,000	10,000	8,000	6,000	30,000
Riboflavin, gms	8	6	6	5	8
d-Pantothenic Acid, gms	16	12	10	8	16
Niacin, gms	75	50	40	30	50
Choline Chloride, gms	1,000	800	600	600	800
Vitamin B <sub>12</sub> , mgs	14	12	10	8	12
Vitamin K Activity, gms	2	2	2	2	2
Folic Acid, mgs	1,000	1,000	1,000	1,000	1,000
Thiamine, mgs	1,000	1,000			1,000
Biotin, mgs	100	100	15		100
Pyridoxine Hydrochloride, mgs	2,000	2,000			2,000

\*Turkey Feed No.

1  
2  
3  
4  
5  
6  
Breeder

\*\*Type of Premix

1  
2  
3  
3  
4  
4  
5

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