

Improving Fertility¹ Of Turkey Eggs

2. Effect of Vitamin E added to the breeder diet.—

Reece L. Bryant² and Robert E. Moreng³

Findings

Vitamin E was added to a turkey breeder diet regarded as having adequate levels of this vitamin present from natural sources. It was found that the addition of 440 units of the Vitamin E was sufficient to increase the fertility and hatchability of the eggs produced by the flock. It can be concluded that supplementing Vitamin E may be necessary in the turkey breeder diet in order to obtain maximum fertility and hatchability when the flock is under the stress of high egg production.

It is quite obvious to the turkey breeder flock owner and the hatcheryman that fertility and hatchability of turkey eggs are variable and sensitive features. Any combination of management, feed and mating methods may be influences in securing favorable results.

Sometimes even the best rations available and the best methods of management can be improved by further supplementation of a specific substance to the diet. This not only makes for better utilization of all the ingredients of the diet, but is helpful in supplementing an increased requirement where one is striving to attain maximum production from the flock. Again one should consider the factor of increased efficiency of production as important in obtaining extra strong poults (Fig. 1) at little increase in cost. The high value of extra poults is an important link between profit and loss.

Vitamin E is known chemically as alpha-tocopherol. It has been described as the vitamin necessary for the preservation of the health of the reproductive organs and parts of the brain. It prevents failure in hatchability as well as loss of fertility in the male chicken. There have been a few reports that indicate Vitamin E may be

¹Data collected during progress of Project B.J.O. 114.

²Poultry Husbandman.

³Assistant Poultry Husbandman.

beneficial to turkey breeder flocks in producing higher fertility and hatchability.

Grains, wheat byproducts, alfalfa meal, green pasture, cereal grasses and wheat germ oil are all good sources of Vitamin E. It is usually felt that these sources occur in feeds at a level which will supply the needs of the chicken and turkey.

Mindful of the adequacy of Vitamin E in the normal ration, a study on fertility and hatchability was carried out. An attempt was made to determine if any advantage could be obtained by adding Vitamin E to the turkey breeder diet composed largely of ground whole grains.

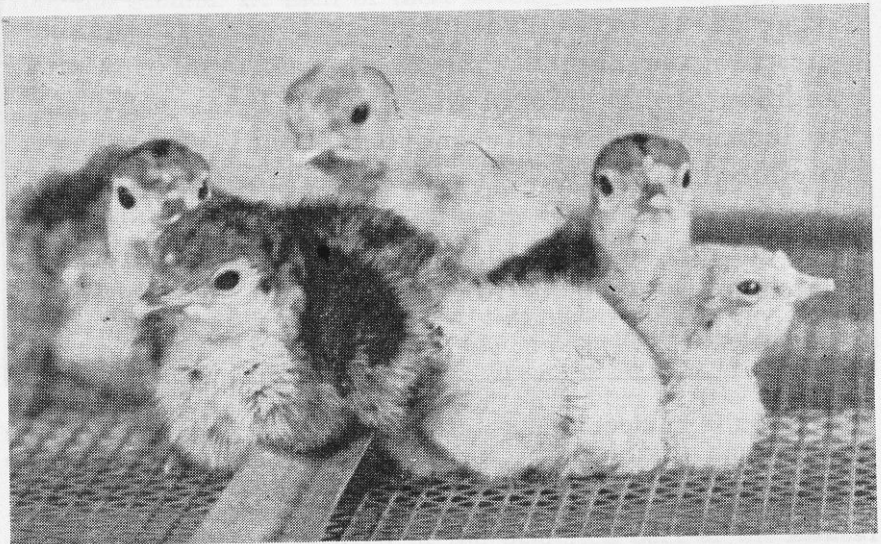


FIGURE 1.—The production of strong and healthy poults is dependent upon the influence of nutrition on the reproductive performance of the breeder flock.

The basal turkey diet used for the season 1953 and 1954 was considered adequate in Vitamin E since it was high in ground whole grains. Table I is a list of the ingredients and their level as they were used. The diet was given as an all-mash diet to the turkey breeder flock approximately one month prior to the collection of eggs for the breeding season and was fed for the remainder of the season. In 1955 the same basal diet was employed but a Vitamin E supplement was added to the diet at a level of 440 units of Vitamin E per ton of feed.

Data were collected on fertility and hatchability of two pens of breeder turkey hens of about 15 birds each in 1953 and 1954 and on four pens of about 15 birds each in 1955. Eggs were held at temperature of 45° F. for one week prior to incubation. All data represent samples of approximately 100 eggs set per hatch for each pen.

TABLE I.—Turkey Breeder Diet. 1953, 1954 and 1955* Breeding Season.

Ingredient	Pounds
Ground Yellow Corn	800
Ground Wheat	400
Middlings	200
Ground Oats	100
Alfalfa Meal 17%	75
Meat Scrap	100
Fish Meal	50
Soybean Meal	200
Bone Meal or Dical.	35
Oyster Shell Flour	20
Iodized Salt	10
Vitamin D (1500 D/gm)	1.0
Vitamin A (5000 A/gm)	1.8
Mn. Sulfate	0.25
Riboflavin (milligrams)	1500 per ton
B12	6 per ton
Niacin	45 gms

*Vitamin E Concentrate (20,000 units per lb.). Added to diet at a level of 10 gms/ton in 1955.

Table II contains the fertility and hatchability data collected during the 1953 season on two pens of breeder hens. It can be seen that fertility varied from hatch to hatch, as did the hatchability of the eggs. Hatchability was at a low level quite constantly. The lower fertility generally was accompanied by lower hatchability of fertile eggs set, although this was not always true. During 1954 the pattern was somewhat comparable to the 1953 pattern, although fertility at the start of the hatching season was rather poor. Hatchability continued at a low level comparable to that obtained during the 1953 season.

TABLE II.—Fertility and Hatchability of Turkey Eggs using Basal Diet high in ground whole Grains supplying natural Vitamin E. Season 1953.

	Hatch Number						
	1	2	3	4	5	6	7
Pen 4							
Percent fertile	74.5	71.2	71.0	81.0	73.0	62.4	56.3
Percent hatch of fertile eggs	85.7	58.8	72.0	62.2	56.2	52.3	50.8
Pen 5							
Percent Fertile	72.5	81.5	90.1	71.6	33.3	74.1	67.5
Percent hatch of fertile eggs	65.8	69.7	63.0	67.9	75.0	63.5	61.5

When Vitamin E was added to the basal diet in the 1955 breeding season a generally higher fertility level was obtained in the majority of the pens for all hatches. Examination of the data reveals a slight increase in the overall hatchability as compared with the 1953 and 1954 seasons. This accompanying increase in hatchability, however, may be credited to the improved fertility.

Although the margin of improvement in fertility and hatchability is limited, one may note from an overall comparison of the

data several points: (1) That there was a general improvement in the level of fertility and hatchability. (2) That fertility within pens was more consistent from hatch to hatch during 1955 than in the previous two years. (3) That the improvement gained by the addition of Vitamin E at the level employed was beneficial in producing more poults from the eggs set. (4) That the level of Vitamin E found in our natural sources, long believed to be adequate, apparently is inadequate to meet the demands of high egg production, high fertility and high hatchability required in efficient turkey production.

TABLE III.—Fertility and Hatchability of Turkey Eggs using Basal Diet high in ground whole Grains supplying natural Vitamin E. Season 1954.

	Hatch Number						
	1	2	3	4	5	6	7
Pen 4							
Percent fertile	35.2	52.1	49.4	79.7	85.9	63.9	60.7
Percent hatch of fertile eggs	73.7	56.0	60.5	79.7	77.2	77.2	53.7
Pen 5							
Percent fertile	12.2	16.0	9.3	39.5	42.5	51.7	59.3
Percent hatch of fertile eggs	33.3	73.3	57.1	62.5	83.8	87.1	81.3

It appears that further studies on this subject are necessary to determine the most practical level of Vitamin E to add to the turkey breeder ration to meet the demands of high egg production. It appears that a higher level of Vitamin E than that used in this study would be appropriate in increasing fertility over that already obtained.

TABLE IV.—Fertility and Hatchability of Turkey Eggs using Basal Diet high in ground whole Grains supplying natural Vitamin E. and Supplemented with 440 units of Vitamin E. Supplement per Ton. Season 1955.

	Hatch Number			
	1	2	3	4
Pen 6				
Percent fertile	70.8	82.6	91.5	89.0
Percent hatch of fertile eggs	65.2	71.1	44.2	71.9
Pen 7				
Percent fertile	58.2	65.6	69.2	92.3
Percent hatch of fertile eggs	50.0	64.3	51.4	60.4
Pen 8				
Percent fertile	77.6	80.9	84.5	85.3
Percent hatch of fertile eggs	76.6	72.6	74.6	71.7
Pen 9				
Percent fertile	9.4	68.2	78.9	88.8
Percent hatch of fertile eggs	70.0	76.7	74.2	80.6