Efficacy of Vitamin E and Selenium on Growth Performance of Broilers

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Abstract

One hundred and ninety two, day old chicks were randomly distributed in eight treatments of two replications in each and reared upto six weeks on standard managemental conditions. The powder of vitamin E and selenium was added to the basal diet @ 0, 20 mg and 40 mcg, 25 mg and 50 mcg, 30 mg and 60 mcg, 20 mg and 40 mcg, 25 mg and 50 mcg, 30 mg and 60 mcg, 0 in treatment groups T_1 to T_8 respectively. The birds of treatment groups T_1, T_2, T_3 and T_4 were immunized against RD and IBD disease while the birds of the groups T_5, T_6, T_7 and T_8 were not immunized against any disease. The average body weights at 6th week of age were 2054.58 ± 29.99, 2060.41 ± 57.99, 2049.08 ± 43.88, 2063.61 ± 34.92, 2054.79 ± 62.24, 2111.54 ± 47.81, 2143.91 ± 44.14 and 1962.35 ± 49.38 g in the treatment groups T_1 to T_8 respectively. The body weight gain and feed efficiency differed significantly ($P<0.01$) among all the treatment groups and it was better in vitamin E and selenium treated and non vaccinated groups than vaccinated and control groups. It was concluded that the supplementation of vitamin E and selenium in the diet has beneficial effect on body weight and feed efficiency of broilers.

Keywords: Vitamin E, Selenium, Vaccination, Broiler, Supplementation, Treatment, Growth.

Introduction

The success of broiler production depends on maximum weight gain within minimum period which can be fulfilled by proper nutritional and manage-mental practices. Administration of certain vitamins, minerals, amino acids and their different combinations to chicken in excess of their supposed requirements enhances their disease resistance. Vitamin E and selenium are one of them. Vitamin E plays important role in enzyme system in the animal body. Vitamin E added to levels beyond those needed to support optimal growth are beneficial in improving the immunocompetence of growing broilers (Erf *et al*., 1998). Rajmane and Ranade (1994) found that the inclusion of vitamin E and C together at 150 mg/kg and 200 mg/kg diet respectively helped in improving both the growth of chicken and their immune response to vaccination. Choct *et al*. (2004) reported that increased dietary selenium content markedly reduce feed conversion ratio as a result of significantly lower feed intake of birds and improved eviscerated weight. Also, Mahmoud and Edens (2005) found that selenium yeast improved body weight and feed conversion ration in broilers. Hence the present investigation was carried out to known the effect of dietary supplemen-tation of vitamin E and selenium in broilers.

Materials and Methods

One hundred and ninety two day old broilers chicks were randomly distributed in eight groups with two replications in each and reared upto six weeks on standard managemental conditions. The powder of vitamin E and selenium was incorporated in the basal ration @ 0, 20 mg and 40 mcg, 25 mg and 50 mcg, 30 mg and 60 mcg, 20 mg and 40 mcg, 25 mg and 50 mcg, 30 mg and 60 mcg, 0 from treatment groups T_1 to T_8 respectively. The treatment groups T_1, T_2, T_3 and T_4 were immunized against RD and IBD disease while treatment groups T_5, T_6, T_7 and T_8 were not immunized against any disease. All the ingredients were analyzed in the laboratory as per AOAC (1990) and ration was formulated accordingly. The parameters like body weight gain, feed consumption and feed efficiency were recorded weekly. The data collected on weekly body weight were analyzed by using Unequal Factorial Completely Randomized Design and data on feed consumption and feed efficiency were analyzed by using Randomized Block Design as per method described by Snedecor and Cochran (1994).

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Results and Discussion

The body weight gain, feed consumption and feed efficiency differ significantly (P<0.01) among all the groups. The body weight and feed efficiency was better in treatment groups supplemented with excess of vitamin E and selenium in diet than the control groups. Also, the body weight and feed efficiency was found better in non vaccinated groups than vaccinated groups which may be due to vaccination stress. The results on live body weights are in agreement with Aravind *et al*. (2001) who reported significant improvement in the live body weight and feed efficiency of broilers supplemented with 75 ppm of vitamin E and 0.15 ppm of selenium per kg in diet, Rajmane and Ranade (1994) who reported better live body weight in broilers fed 150 mg of vitamin E per kg in diet and Villar-Patino *et al*. (2002) found the improved live body weight in broilers supplemented with 75 mg of vitamin E per kg in diet. The observations on feed consumption are in accordance with Choct *et al*. (1997) who reported significantly lower feed intake in birds given excess selenium in the diet. The feed efficiency was observed better in excess vitamin E and selenium supplemented groups and are in agreement with Serman *et al*. (1992) who found the improvement in feed efficiency in broilers fed 60, 90 and 120 IU/kg of vitamin E in the diet than control groups. Similarly Aravind *et al*. (2001) also observed improvement in feed efficiency in broiler birds supplemented with 0.15 ppm of selenium and 75 ppm of vitamin E/kg in diet. The dressing percentage was observed better in vitamin E and selenium supplemented groups, but the differences among the groups were non-significant. The similar results were also observed by Aravind *et al*. (2001) and Choct *et al*. (2004) in broilers. It was concluded that supplementation of vitamin E and selenium in the diet has significant effect on body weight and feed efficiency in broilers.

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Table-1. Composition of experimental diets

Composition (%)	Starter	Finisher
Maize	53.2	60.5
Soybean meal	43.5	34.8
Trace mineral mixture	0.05	0.05
Vitamin mixture	0.1	0.1
DCP	1.65	1.65
Lime stone powder	1.45	1.45
Soybean oil	0	0.8
Salt	0.30	0.35
Synthetic methionine	0.042	0.093
CP	**23.06**	**20.06**
ME (Kcal/kg)Calculated	**2800.9**	**2901**

Table-2. Mean body weight change, feed consumption and feed efficiency in different treatment groups

Groups	Parameters				
	Initial BW (g)	Final BW**(g)	Feed consumption** (g)	FCE	Dressing %
T_1	34.42 ± 0.66	2054.58^{b} ± 29.99	4063.86^{d}± 43.75	1.86 ± 0.17	64.17 ± 0.69
T_2	34.79 ± 0.74	2060.41^{b} ± 57.99	4180.45^{e} ± 55.36	1.86 ± 0.18	66.87 ± 1.69
T_3	33.88 ± 0.44	2049.08^{b} ± 43.88	3924.54^{b}± 61.45	1.84 ± 0.13	68.46 ± 2.34
T_4	34.50 ± 0.48	2063.61^{b} ± 34.92	3913.83^{b} ± 32.07	1.73 ± 0.21	70.51 ± 1.11
T_5	34.75 ± 0.42	2054.79^{b} ± 62.24	3967.17^{bc} ± 37.50	1.80 ± 0.15	65.66 ± 1.86
T_6	35.29 ± 0.51	2111.54^{c} ± 47.81	3990.88^{c} ± 75.46	1.80 ± 0.14	66.19 ± 3.02
T_7	35.71 ± 0.53	2143.91^{d} ± 44.14	4015.19^{cd} ± 34.27	1.70 ± 0.22	67.96 ± 0.85
T_8	35.13 ± 0.34	1962.35^{a} ± 49.38	3820.59^{a} ± 47.59	1.83 ± 0.21	65.98 ± 0.17

a, b, c mean values having different superscript in column differ significantly, ** - (P<0.01)