

## Effect of Vitamin A, Vitamin C, Vitamin E and Levamisole on Performance of Broilers

A.B. Rajput<sup>1</sup>, B.R. Kolte<sup>2</sup>, J.M. Shisodiya<sup>1</sup>, J.M. Chandankhede<sup>1</sup> and J.M. Chahande<sup>3</sup>

Department of Poultry Science,  
Nagpur Veterinary College, MAFSU, Nagpur.  
Corresponding author email : dratulrajput@rediffmail.com

### Abstract

One hundred and eighty (180) unsexed day-old, commercial broiler chicks were purchased from Venkateshwara Hatcheries Pvt. Ltd. These chicks were weighed individually and uniformly distributed as 30 chicks in each of six groups. Each group was divided into two replicates with 15 chicks in each. The birds were offered feed and water *ad-libitum*. The chicks were fed with starter mash which contained crude protein 22% and metabolizable energy 2918 Kcal / kg up to three weeks of age. For next 3 weeks i.e. from 4 to 6 weeks of age with finisher mash which contained crude protein 20% and metabolizable energy 2966 Kcal/ kg. Group T0 (control group) was fed standard broiler mash. In group T1 Vitamin A was added @ 8500 IU/ litre of Drinking water. Group T2 was fed Broiler mash + Vitamin C @ 500 mg/ kg of feed. Group T3 was fed Broiler mash + Vitamin E @ 300 mg/ kg of feed. Group T4 was given Broiler mash + Levamisole @ 2 gm/ kg of feed and group. T5 was provided with the combination of all the feed supplements Vitamin A added @ 8500 IU/ litre of Drinking water, Broiler mash + Vitamin C @ 500 mg/ kg of feed + Vitamin E @ 300 mg/ kg of feed + Levamisole @ 2 gm /kg of feed. The results of economics of broiler production showed that net cost of production per bird was maximum for T5 (Rs. 76.78) followed by T4 (Rs. 67.34), T1 (Rs. 66.56), T0 (Rs. 59.11), T2 (Rs. 58.16) and T3 (Rs. 58.02). The net profit per bird for groups T0, T1, T2, T3, T4 and T5 was Rs. 28.44, 21.49, 30.59, 30.48, 20.41 and 11.12, respectively. The supplemented groups T2 and T3 have more net profit than control group. However, group T1, T4 and T5 had less net profit than the control group.

**Keywords:** Vitamin, Levamisole, Broiler, Performance, Feed Conversion Ratio.

### Introduction

Today the poultry industry is witnessing series of problems such as various disease outbreaks, harsh climatic conditions, high cost of feeding and day by day decreasing profit margin. The success of broiler production depends on maximum weight gain within minimum period and which can be fulfilled by proper nutritional and managemental practices. So as to increase the growth performance of the birds various nutrients are to be incorporated in the diet. Studies have been conducted with various levels of Vitamins like A, C, E and Levamisole to examine the effect on performance of broilers.

Keeping in view the importance of the above feed supplements in the broiler ration for the body weight and feed efficiency, the present research work was aimed with objectives to study the effect of Vitamin A, C, E and Levamisole alone and in combination on the performance of broilers and study the economics of broiler production.

### Materials and Methods

One hundred and eighty (180) unsexed day-old, commercial broiler chicks were purchased from Venkateshwara Hatcheries Pvt. Ltd. These chicks were weighed individually and uniformly distributed as 30 chicks in each of six groups. Each group was divided into two replicates with 15 chicks in each.

The birds were offered feed and water *ad-libitum*. The chicks were fed with starter mash which contained crude protein 22% and metabolizable energy 2918 Kcal / kg up to three weeks of age. For next 3 weeks i.e. from 4 to 6 weeks of age with finisher mash which contained crude protein 20% and metabolizable energy 2966 Kcal/ kg. Group T0 (control group) was fed standard broiler mash. In group T1 Vitamin A was added @ 8500 IU/ litre of Drinking water. Group T2 was fed Broiler mash + Vitamin C @ 500 mg/ kg of feed. Group T3 was fed Broiler mash + Vitamin E @ 300 mg/ kg of feed. Group T4 was given Broiler mash + Levamisole @ 2 gm/ kg of feed and group. T5 was provided with the combination

1.M.V.Sc. Student 2.Professor and Head 3.Associate Professor, Dept. of LPM.

of all the feed supplements Vitamin A added @ 8500 IU/ litre of Drinking water, Broiler mash + Vitamin C @ 500 mg/ kg of feed + Vitamin E @ 300 mg/ kg of feed + Levamisole @ 2 gm /kg of feed.

#### Results and Discussion

The parameters studied were average weekly live body weight, weekly gain in body weight, weekly feed consumption and feed conversion ratio. At the end of 6<sup>th</sup> week, group supplemented with Vitamin C (T2 group) recorded significantly higher body weights over control group T0 and T4 group. The means being (743.17<sup>c</sup>, 737.08<sup>ab</sup> and 735.52<sup>a</sup> g) for T2, T4 and T0 control group respectively. The findings recorded in present study are in agreement with those recorded by Pardue *et al.* (1985), Edrison *et al.* (1986), Jadhav (2005).

Supplementation of Vitamin E (T3 group) showed significantly ( $P < 0.01$ ) higher body weight than unsupplemented group. The means being (741.48<sup>bc</sup> and 735.52<sup>a</sup> g) for T3 and T0 group respectively. The findings reported by Rajmane and Ranade (1994), Swain *et al.* (2000), Arvinda *et al.* (2001), K. Mani *et al.* (2001), Villar-Patino *et al.* (2002), Bobade (2006) and Raza *et al.* (1996) who supplemented Vitamin E at 300 IU/ kg found increased body weight, are in agreement with results observed in present study.

Vitamin A supplemented group (T1) when compared with control (T0) recorded non-significant difference in mean body weight. The averages being (739.44<sup>abc</sup> and 735.52<sup>a</sup>g) respectively. The observations recorded in present study are in agreement with those reported by Sklan *et al.* (1994) and Sayed and Abdel Ghaffer (2004).

Supplementation of Levamisole (T4 group) when compared with control (T0) recorded non-significant difference in mean body weight. The averages being (737.08<sup>ab</sup> and 735.52<sup>a</sup>g) respectively. The observations recorded in present study are in agreement with those reported by K. Mani *et al.* (2001) who also found non-significant difference in weekly average body weight. Giambrone and Klesius (1985) also reported better weekly average body weight than the control group.

Vitamin A, Vitamin C, Vitamin E and Levamisole (T5 group) when supplemented in combination showed non-significant difference in mean body weight over the control group. The means being (738.48<sup>ab</sup> and 735.52<sup>a</sup> g) respectively.

In the present study, the average weekly gain in body weight recorded for Vitamin C supplemented group (T2) showed significantly higher gain in body weight as compared to control group. The means being (287.63<sup>c</sup> and 283.55<sup>a</sup>g) for T2 group and T0 control group respectively. The findings recorded in present

study are in agreement with those recorded by Fah (1978), Nakaya *et al.* (1986), Vathana *et al.* (2002), Jadhav (2005) and Nagra *et al.* (2005).

Supplementation of Vitamin E (T3) showed significantly higher gain in body weight than the control group. The means being (286.76<sup>bc</sup> and 283.55<sup>a</sup> g) for T3 group and T0 control group respectively. The findings reported by Serman *et al.* (1992), Maurice and Lightsey (1996), Raza *et al.* (1996), Singh *et al.* (2005) and Bobade (2006) are in agreement with the results observed in present study.

Vitamin A (T1) supplementation when compared with control group (T0) reported no significant difference in mean weekly gain in body weight. The averages being (285.31<sup>abc</sup> and 283.55<sup>a</sup> g) for T1 and T0 control group respectively.

Supplementation of Levamisole (T4 group) when compared with control (T0) recorded non-significant difference in mean body weight. The averages being (284.23<sup>ab</sup> and 283.55<sup>a</sup> g) respectively. The observations recorded in present study are in agreement with those reported by Panda *et al.* (2004) who also reported non-significant difference in average weekly body weight gain.

Vitamin A, Vitamin C, Vitamin E and Levamisole (T5 group) when supplemented in combination showed non-significant difference in mean body weight. The means being (284.76<sup>abc</sup> and 283.55<sup>a</sup> g) respectively.

The average feed consumption for Vitamin C group (T2) was significantly lower than the control group (T0). The means being (650.30<sup>c</sup> and 678.94<sup>a</sup> g) for T2 and T0 group respectively. Similar observations were also recorded by Tuleun and Njoku (2000), Lin Hai *et al.* (2003) who reported decreased feed consumption with Vitamin C supplementation.

The average feed consumption for Vitamin E supplemented T3 group (652.83<sup>bc</sup> g) remained lower than T0 control group (678.94<sup>a</sup> g). Similar observations of reduced feed consumption due to Vitamin E supplementation were reported by Shaikh *et al.* (2005) and Bobade (2006).

The supplementation of Vitamin A, Vitamin C, Vitamin E and Levamisole in combination (T5 group) to broilers had significantly lower feed consumption than T0 control group. The means being (660.72<sup>bc</sup> g) and (678.94<sup>a</sup> g) for T5 and T0 groups respectively.

The mean feed consumption of Levamisole (T4 group) was lower than the control group T0. The averages being (661.19<sup>bc</sup> and 678.94<sup>a</sup> g) respectively. The observations recorded in present study are in agreement with those reported by Panda *et al.* (2004) and Funde (2005).

Supplementation of Vitamin A (T1) group has lower mean feed consumption as compared with control group (T0). The averages being (669.64<sup>ab</sup> and 678.94<sup>a</sup> g) for T1 and T0 control group respectively. The observations in present study are in agreement with those reported by Sayed and Abdel Ghaffer (2004). In present study, significantly ( $P < 0.05$ ) better mean feed efficiency was recorded in T2 group when compared with control group (T0). The means being (2.12<sup>b</sup> and 2.22<sup>a</sup>) for T2 and T0 groups respectively. These findings of improvement in feed efficiency are in agreement with the findings recorded by Njoku and Nwazota (1989), Tuleun and Njoku (2000), Pardue *et al.* (2002), Vathana *et al.* (2002) and Nagra *et al.* (2005) who reported improved FCR with Vitamin C supplementation.

In Vitamin E supplementation group (T3), significantly ( $P < 0.05$ ) better feed efficiency was recorded when compared with control group (T0). The means being (2.13<sup>b</sup> and 2.22<sup>a</sup>) for T3 and T0 groups respectively. These results obtained in present study are in agreement with the findings of Serman *et al.* (1992), Raza *et al.* (1996), Swain *et al.* (2000), Arvinda *et al.* (2001), Shaikh *et al.* (2005) and Bobade (2006) who reported better FCR when Vitamin E was supplemented to the broilers. K. Mani (2001) and Panda *et al.* (2004) also reported better feed efficiency in Vitamin E supplemented group.

Supplementation of Levamisole (T4) also recorded non-significant difference of mean feed efficiency as compared with control group T0. The means being (2.16<sup>ab</sup> and 2.22<sup>a</sup>) for T4 and T0 groups respectively. Similar results were also observed by K. Mani *et al.* (2001) who reported non-significant difference in FCR. However, Panda *et al.* (2004) and Funde (2005) reported significantly better FCR (1.99) when Levamisole was supplemented.

Vitamin A (T1) supplemented group showed better feed efficiency over the control group T0. The means being (2.19<sup>ab</sup> and 2.22<sup>a</sup>) for T1 and T0 groups respectively. These findings of improvement in feed efficiency are in agreement with the findings recorded by Sayed and Abdel Ghaffer (2004).

The supplementation of Vitamin A, Vitamin C, Vitamin E and Levamisole in combination (T5 group) to broilers had better FCR over T0 control group. The means being (2.17<sup>ab</sup> and 2.22<sup>a</sup>) for T5 and T0 groups respectively.

The results of economics of broiler production showed that net cost of production per bird was maximum for T5 (Rs. 76.78) followed by T4 (Rs. 67.34), T1 (Rs. 66.56), T0 (Rs. 59.11), T2 (Rs. 58.16) and T3 (Rs. 58.02). The net profit per bird for groups T0, T1, T2, T3, T4 and T5 was Rs. 28.44, 21.49, 30.59, 30.48, 20.41 and 11.12, respectively. The supplemented groups

T2 and T3 have more net profit than control group. However, group T1, T4 and T5 had less net profit than the control group.

#### References

1. Abdel Raheem, H. A. and S. K. A. Ghaffar (2004): Effect of ascorbic acid, Vitamin E and melatonin on performance and immune response of broilers. *Assiut Vet. Med. J.* 50 (101): 215-233.
2. Arvinda, K. L., C. V. Gowda; B. P. Manjunath; A. Y. Rajendera and S. P. Ganpule (2001): Influence of dietary level of selenium and vitamin E on growth, immunity and carcass traits in broiler chickens, *Ind. J. Poult. Sci.* 36(1): 58-62.
3. Bobade, S. P. et. al. (2009): Use of Vitamin E and Selenium on the performance of Broilers, *Veterinary World* . 2(1): 20-21
4. Edrize, B. M.; A. W. Khair-El-din and R. Soliman (1986): The immunopotentiating effect of ascorbic acid against Newcastle disease in chicken. *Vet. Med. J.* 34 (2): 251-264.
6. Funde, S. T. (2005): Effect of *Ocimum sanctum*, *Embllica officinalis* and Levamisole on immune response in immunosuppressed broilers. M.V.Sc. Thesis submitted to M.A.F.S.U., Nagpur.
7. Giambrone, J. J. and P. H. Klesius (1985): Effect of levamisole on the response of broilers to coccidiosis vaccination on poultry. *Poult. Sci.* 64: 1083.
9. Mani, K.; K. Sundarsan and K. Vishwanathan (2001): Effect of immunomodulators on performance of broilers in aflatoxicosis. *Ind. Vet. J.* 78: 1126-1129.
10. Maurice, D. V. and S. F. Lightsey (1996): Immuno-competence of slow and fast growing broiler chickens fed different level of vitamin E. *XX World's Poult. Cong.* 11: 93-98.
11. Nagra, S. S.; S. Sodhi; Yashpal Singh and P. N. Diwedi (2005): Effect of Vitamin C supplementation on performance of broiler chicks during heat stress. *Proceeding of XXIII IPSACO N*, 2<sup>nd</sup> - 4<sup>th</sup> Feb: 181.
12. Nakaya, T.; S. Suzuki and K. Watanabe (1986): Effect of high dose supplementation of ascorbic acid on chicks. *Japanese Poult. Sci.* 23(5): 276-283.
13. Njoku, P. C. (1986): Effect of dietary ascorbic acid supplementation on the performance of broiler chicken in a tropical environment. *Anim. Feed Sci. Tech.* 16(1/2): 17-24.
16. Rajmane, B. V. and A. S. Ranade (1994): Effect of dietary vitamin E and C on growth and immune response of broilers. *Ind. J. Poult. Sci.* 29(2): 78.
18. Sayed, A. N. and S. K. Abdel-Ghaffar (2004): Effect of dietary supplemental levels of vitamin A on the performance and immune response of heat stressed broilers. *Assiut Veterinary Medical Journal.* 50(102): 285-300.
20. Shaikh, A. K. K.; Eswaraiah, V. Ravinder Reddy, A. Nageswara Rao and M. V. L. N. Raju (2005): Effect of supplementation of Vitamin E and Selenium on the growth and immune response in broilers. *Ind. J. Poult. Sci.* 40(3): 235-240.