

INFLUENCE OF FEEDING L-THREONINE ON THE PRODUCTIVE PERFORMANCE OF EGG TYPE JAPANESE QUAIL BREEDERS IN THE STARTER AND GROWER PHASE

T. Sasidhar*, K. Mani, K. Rajendran, T. Vasanthakumar and U. Prabhakaran

Department of Poultry Science
Veterinary College and Research Institute, Namakkal – 637 002,
Tamilnadu Veterinary and Animal Sciences University
E-mail: sasidharthangavel@gmail.com (**Corresponding Author*)

Abstract: A biological experiment was conducted by supplementing threonine at 0.05 and 0.10 per cent level in the basal diet of Japanese quail breeders for a period of 6 weeks to assess the productive performance. The result of the experiment revealed that dietary inclusion of threonine had significant influence ($P<0.05$) on body weight and body weight gain of Japanese quail breeders whereas L-Threonine had no significant effect on feed consumption and feed conversion ratio.

Keywords: Japanese quail, Threonine, Body weight, Feed consumption, Feed conversion.

Introduction

Threonine is the third limiting amino acid for poultry which comes from soya bean meal and increasing level of dietary threonine expresses better performance in body weight gain, feed conversion ratio and breast meat development in broilers. L-threonine is added to the diet to exactly match dietary amino acid balance with the unique nutritional requirement of the bird and many studies have been reported in threonine on meat type Japanese quail but no information on production performance of egg type Japanese quail breeders by feeding threonine. So the current experiment was conducted to evaluate the effect of dietary supplementation of L-threonine on production performance of egg type Japanese quail breeders in starter and grower phase.

Materials and Methods

A biological experiment was conducted by using 240 day old Japanese quail breeder chicks belonging to single hatch. These quails were randomly grouped into 3 treatments with 4 replicates of 20 birds each. All the birds were reared under standard managerial conditions up to 6 weeks of age and the commercially available L-threonine was incorporated into the standard Japanese quail breeder diet to form different experimental diets.

*Received April 16, 2016 * Published June 2, 2016 * www.ijset.net*

Throughout the study period of 6 weeks, data on daily feed consumption, weekly body weight and mortality, if any were recorded. The data collected were subjected to statistical analysis as per the method suggested by Snedecor and Cochran (1989). The treatment groups of the experiment were as follows:

Treatment groups	Particulars	Number of replicates per treatment	Number of birds per replicate	Total number of birds per treatment
T ₁	Basal diet	4	20	80
T ₂	Basal diet + 0.5 g L-Threonine/ kg of diet	4	20	80
T ₃	Basal diet + 1 g L-Threonine/ kg of diet	4	20	80
Total				240

Results and Discussion

The mean (\pm S.E.) production performance of Japanese quail breeders reared from 0 to 6 weeks of age as influenced by dietary supplementation of L-threonine are represented in Table I.

The analysis of variance of data revealed that there was a significant difference ($P < 0.05$) in the body weight and body weight gain between treatment groups at 6th week of age. At sixth week of age, the group T₂ recorded the highest body weight (225.30 g) followed by T₃ (225.05 g) and T₁ (217.36 g) groups. Similarly, the body weight gain was highest in T₂ (217.08) group followed by T₃ (216.78 g) and T₁ (209.12 g) groups.

There was no significant difference ($P < 0.05$) in the cumulative feed consumption and feed conversion ratio between treatment groups throughout the study period. However, at six weeks of age, the group T₂ recorded the highest feed consumption (772.96 g) followed by T₃ (772.25 g) and T₁ (767.28 g) groups and the feed conversion ratio at six weeks of age was best in T₃ (3.56) group followed by T₂ (3.57) and T₁ (3.67) groups.

There was no significant difference in livability between any of the treatment groups. The age at sexual maturity was earliest in group T₃ (43 days) followed by T₂ (44 days) and T₁ (46 days) groups.

The results were in accordance with the findings of Kidd (1999), Kidd *et al.* (1999), Corzo *et al.* (2003), Baylan *et al.* (2006), Ton *et al.* (2013), Shirzadegan *et al.* (2015) who also recorded higher body weight, body weight gain and feed consumption due to L-threonine supplementation. Similarly, Razaepour and Gazani (2014) recorded no significant differences in feed conversion ratio by supplementing L-threonine in the broiler diet.

Summary

It has been concluded that by feeding different levels of dietary L-threonine to egg type Japanese quail breeders, the group T₂ and T₃ (0.05 and 0.1 % L-threonine) recorded higher body weight and body weight gain compared to the control group at six weeks of age. There was no significant difference on the feed consumption, feed conversion ratio and livability between the treatment groups due to L-Threonine supplementation at six weeks of age. The age at sexual maturity was earliest in T₃ group (43 days). So it is suggested to add L-Threonine at 0.1 per cent level in egg type Japanese quail breeders at starter and grower phase.

Table I: Mean (\pm S.E) production performance of Japanese quail breeders reared from 0 to 6 weeks of age as influenced by different levels of L-threonine in the feed

Parameters	T ₁	T ₂	T ₃
Body weight (g)	217.36 ^b \pm 2.18	225.30 ^a \pm 2.22	225.05 ^a \pm 1.76
Body weight gain (g)	209.12 ^b \pm 2.18	217.08 ^a \pm 2.24	216.78 ^a \pm 1.76
Cumulative feed consumption (g)	767.28 \pm 5.74	772.96 \pm 6.63	772.25 \pm 7.92
Cumulative feed conversion	3.67 \pm 0.03	3.57 \pm 0.07	3.56 \pm 0.06
Livability (%)	93.75	91.25	92.50
Age at sexual maturity (days)	46	44	43

Value given in each cell is the mean of 80 observations

^{a-b} Means within a column with no common superscript differ significantly (P<0.05)

References

- [1] Baylan, M., Canogullan, S., Ayasan, T. and Sahin, A. (2006) Dietary threonine supplementation for improving growth performance and edible carcass parts in Japanese quails, *Coturnix coturnix japonica*. *International Journal of Poultry Science*, **5**(7): 635-638.
- [2] Corzo, A., Kidd, M.T. and Kerr, B.J. (2003) Threonine need for growing female broilers. *International Journal of Poultry Science*, **2**(6): 367-371.
- [3] Kidd, M.T. (1999) Nutritional research on threonine in broilers. *Proc. Aust. Poult. Sci. Sym.*, pp. 16-22.
- [4] Kidd, M.T., Lerner, S.P, Pallard, J.P., Rao, S.K. and Halley, J.T. (1999) Threonine needs of finishing broilers: growth, carcass and economic responses. *J. Appl. Poultry Res.*, **8**: 160-169.
- [5] Rezaeipour, V. and Gazani, S. (2014) Effects of feed form and feed particle size with dietary L-threonine supplementation on performance, carcass characteristics and blood

biochemical parameters of broiler chickens. *Journal of Animal Science and Technology*, **56**(20): 1-5.

[6] Shirzadegan, K., Nickkah, I. and Jafari, M.A. (2015) Impacts of dietary L-threonine supplementation on performance and intestinal morphology of broiler chickens during summer time. *Iranian Journal of Applied Animal Science*, **5**(2): 431-436.

[7] Ton, A.P.S., Furlan, A.C., Martins, E.N., Batista, E., Pasquetti, T.J. Scherer, C., Iwahashi, A.S., Quadros, T.C.O. (2013) Nutritional requirements of digestible threonine for growing meat-type quails. *R. Bras. Zootec.*, **42**(7): 504-510.