The Indian Journal of Veterinary Sciences & Biotechnology ***(2017) Volume 12, Issue 4, 74-77***

ISSN (Print) : 2394-0247 : ISSN (Print and online) : 2395-1176, abbreviated as IJVSBT

http://dx.doi.org/10.21887/ijvsbt.v12i4.7685

Submitted : 07-02-2017 ***Accepted : 23-03-2017*** ***Published : 05-05-2017***

Effect of Varied Levels of Dietary Crude Protein and Metabolizable Energy on Growth Performance in Giriraja Chicken

H.N. Rajeswara, Jaya Naikand C.S. Nagaraja

Department of Poultry Science,

Veterinary college, KVAFSU, Hebbal, Bangalore, 560024, India

Corresponding Author: hnrajesh111@gmail.com

Abstract

A study was conducted for 56 days to observe the effect of varied levels of dietary crude protein and metabolizable energy on growth performance in 720 day-old Giriraja chicks, which were divided equally into nine groups of 80 birds each. Nine different experimental diets were formulated with three levels 2700, 2800, and 2900 kcal of metabolizable energy (ME/kg), each with three levels of protein (CP), *viz.,* 19%, 20%, and 21%, respectively and Group T_5 served as control fed with 20% protein and 2800 kcal energy as per BIS (2007) requirements. Feed consumption, body weight gain, and feed conversion ratio (FCR) were analysed up to 56 days. The results of the study indicated that diet containing 20% CP with 2900 kcal ME/kg showed enhanced growth performance in Giriraja chicks.

Keywords: Body weight gain, Metabolizable energy, Protein, Giriraja.

Introduction

Backyard poultry farming by and large was a low input venture. Besides income generation, backyard poultry farming helps in alleviation of malnutrition of the rural people through the production of valuable animal protein and empowers rural women (Besbes *et al.,* 2012). The University of Agricultural Sciences, Bangalore released the first improved coloured bird suitable for backyard rearing 'Giriraja' in 1989. Giriraja is a pioneer bird and blazed to strengthen the economy of the rural poor by producing good number of eggs (75-180/yr) as well as good quantity/quality meat (3-6 kg body weight) under rural conditions (Reddy and Rajendiran, 2002).Though it is widely accepted by poultry farmers all over the state for rural poultry farming, scientific studies on different aspects of production in these birds are scanty especially with respect to nutrients, hence an experiment is designed to study the effect of varied levels of dietary crude protein and metabolizable energy on growth performance in Giriraja birds.

Materials and Methods

The experiment was conducted to investigate the effect of varied levels of dietary crude protein and metabolizable energy on growth performance in Giriraja chicken at the Department of Poultry Science, Veterinary College, KVAFSU, Hebbal, Bangalore. Feed ingredients were procured and

proximate analysis was determined before compounding experimental diets, and feed formulation was done as per BIS (2007).

A total of 720 day-old chicks of Giriraja were procured from the Poultry Department ,individually weighed and distributed into nine groups having 80 birds in each. Each group was further subdivided into four replicates having 20 birds in each. Nine different experimental diets (T_1 to $T_{9)}$ were formulated with three levels of energy 2700, 2800, and 2900 kcal metabolizable energy (kcal/kg), each with three levels of protein, *viz.,* 19%, 20%, and 21%, respectively. Group T_5 served as control fed with 20% protein and 2800 kcal energy as per BIS (2007)requirements. Feed consumption, body weight gain and feed conversion ratio (FCR) were analysed up to 56 days.

Data were analyzed as per standard procedures described by Snedecor and Cochran (1994) and by using SPSS software version 20.0.

Results and Discussion

Data on different parameters such as feed consumption, bodyweight gain, and FCR are presented in table 1.

Feed consumption

The effect of different dietary levels of protein and energy on feed intake showed a significant ($p<0.05$) effect among the different treatment groups (Table-1). Feed intake during the entire experimental period, ranged from 2923.12 g (T_7) to 3512.52 g (T_2), which was influenced by level of protein and energy in the diet. Giriraja chicken reared on 19% crude protein (CP) with 2900 kcal ME/kg showed lower feed intake significantly different from T_1, T_2, $T_{3,}$ and T_5 groups, but comparable with T_4, T_6, $T_{8,}$ and T_9.

Table-1: Effect of varied levels of dietary crude protein and metabolizable energy on average feed intake (g/bird), average bodyweight gain (g/bird) and FCR at 8th week in Girirajachicks

	T1	T2	T3	T4	T5	T6	T7	T8	T9
CP %	19	20	21	19	20	21	19	20	21
ME (Kcal/kg)	2700	2700	2700	2800	2800	2800	2900	2900	2900
Feed consumption (g/bird)	3511.46^{b} ±24.83	3512.52^{b} ±35.64	3502.80^{b} ±95.23	3273.71^{ab} ±72.17	3316.19^{b} ±87.80	3289.11^{ab} ±11.24	2923.12^{a} ±122.82	3144.07^{ab} ±87.85	3193.31^{ab} ±87.10
Body Weight Gain(g/bird)	1505.53^{b} ±13.72	1520.39^{bc} ±12.02	1540.28^{bc} ±15.94	1556.08^{bc} ±18.49	1557.64^{bc} ±16.46	1514.58^{b} ±16.23	1407.64^{a} ±17.15	1591.87^{c} ±22.44	1564.58^{bc} ±18.89
FCR(kg/kg)	2.34^{b} ±0.04	2.32^{b} ±0.04	2.29^{ab} ±2.11	2.11^{ab} ±0.05	2.13^{ab} ±0.11	2.18^{ab} ±0.05	2.08^{ab} ±0.10	1.98^{a} ±0.04	2.04^{ab} ±0.04

Means bearing different superscript in the same row differs significantly (PÂ0.05)

Body weight gain and FCR

The body weight gain and FCR in birds was found to be highly significant ($p<0.05$), where it was found that moderate protein and higher energy level has a positive effect on body weight gain.

Highest body weight gain of 1591.87 g was found in T_8 group which was significantly different from T_1, T_6, and T_7 groups, but it was comparable with $T_{2,}$ T_3 T_4 T_5 and T_9 group. Lowest body weight gain of 1407.67g was observed in T_7 group.

During the entire experimental period, the FCR was significantly influenced by the level of protein

and energy. It was observed that the FCR value (1.98) was lowest in T_8 group (2900 kcal/kg energy and 20% CP) and significantly greater than T_1 and T_2 diet having 19% and 20% protein with 2700 kcal energy, respectively and FCR was not significantly different among T_1,T_2,T_3 T_4 T_5, T_6, T_7 and T_9.

The above results indicated that chicken reared on a higher level of protein and energy consumed less feed than the diet having lower level protein and energy, which affects the feed intake. This result is on agreement with observation that feed efficiency improved and feed intake reduced with increasing dietary concentrations of these nutrients. Thus, a proper calorie protein ratio is needed in the ration for optimum intake of nutrient through feed consumption (Rao *et al*., 2005).

The body weight gain indicated that ration containing 20% and 21% CP at higher energy gained maximum growth. The results are in agreement with Bamgbose (1999) findings as high energy and high protein had a positive effect on growth rate and vanaraja chicks fed diet with 19% and 21% CP and 3000 kcal ME/kg utilized feed more efficiently than the lower level of protein and energy in the diet (Perween *et al.,* 2016). As reported by Haunshi *et al*. (2012) that different ME levels had a significant effect on body weight gain, feed intake, and FCR. However, feeding the 19.64% CP diet was adequate, above which no significance improvement in performance was achieved in broiler chicken (Miah *et al*., 2014).

Banerjee *et al*. (2013) investigated the effect of feeding different levels of CP, but similar levels of energy on Koekoeck chickens (dual purpose breed) and found that increasing in the level of protein in the diets did not influence the overall body weight gain and final live weight of chickens. However, the FCR improved numerically with increasing levels of protein in the diet. But there is a threshold above and below which the protein concentration as a nutrient is not justifiable (Si *et al.,* 2001).

Hence, the results of this study indicated that diet containing 20% CP with 2900 kcal ME/kg is beneficial in improving the growth performance in Giriraja chicks.

Acknowledgements

The authors express their gratitude to KVAFSU, Hebbal, Bangalore, Karnataka, India, for providing the facilities for conducting this experiment.

References:

Bamgbose A.M.(1999). Utilization of maggot meal in cockerel diet. Indian J.Anim. Sci. **(2)**:1056–1058.

Banerjee S, Melesse A, Dotamo E, Berihun K. and Beyan M. (2013). Effect of feeding different dietary protein levels with iso-caloric ration on nutrients intake and growth performances of dual-purpose Koekoeck chicken breeds. Int. J. Appl. Poult. Res., **2**(2):27–32.

Besbes B, Thieme O, Rota A, Guèye E.F. and Alders R.G. (2012). Technology and programmes for sustainable improvement of village poultry production. Alternative Systems for Poultry: Health, Welfare and Productivity. Wallingford: CAB International; pp. 110–127.

BIS (2007).. Indian Standard, Poultry Feeds Specifications. 5th Review. New Delhi, India: Bureau of Indian Standards;

Haunshi S, Panda A.K, Rajkumar U, Padhi M.K, Niranjan M. and Chatterjee R.N. (2012). Effect of feeding different levels of energy and protein on performance of Aseel breed of chicken during juvenile phase. Trop. Anim. Health Prod., **44**(7):1653–1658.

Miah M.Y, Chowdhury S.D, Bhuiyan A.K.F. and Ali M.S. (2014). Effect of different levels of dietary energy on growth performance of indigenous desi chicks reared in confinement up to target weight of 950 g. Livest. Res. Rural Dev., **26**(7):124.

Perween S, Kumar K, Kumar S, Chandramoni, Sanjay kumar, Singh P.K, Manoj Kumar and

Amitavadey. (2016). Effect of feeding different dietary levels of energy and protein on growth performance and immune status of Vanaraja chicken in the tropic. Veterinary world, **9**(8):893-899.

Rao S.V.R, Panda A.K, Raju M.V.L, Sunder G.S, Bhanja S.K and Sharma R.P. (2005). Performance of Vanaraja chicken on diets containing different concentrations of metabolizable energy at constant ratio with other essential nutrients during juvenile phase. Indian J. Poult. Sci., **40**(3):245–248.

Reddy, B.S.V. and Rajendiran, A.S. (2002). Nutritional support for Giriraja under adverse environment. Paper presented at State level Seminar Organized by the State Department of Animal Husbandry and Veterinary Services, Government of Karnataka held on 8th March, 2002 at Bangalore.

Si J, Fritts C.A., Burnham D.J.andWaldroup P.W. (2001). Relationship of dietary lysine level to the concentration of all essential amino acids in broiler diets. Poult. Sci., **80**: 1472-1479

Snedecor, G.W. and Cochran, A.W. (1994). Statistical Methods, IXthEdn., Oxford and IBH Publ. CO., Calcutta.

SPSS. (2011). Statistics Version 20.0. USA: IBM SPSS Inc;

❑