

Growth Performance of Broilers Fed Dietary Neem Leaf Powder (*Azadirachta indica*) And Ginger Root Powder (*Zingiber officinale*), As Natural Feed Additives



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Abstract

An experiment was conducted on 72 day old broiler chicks were divided into five groups, T0, T1, T2, T3, T4, and T5 which were supplemented with two levels of Ginger root powder (GRP) @ 0.75, and 1.25g and Neem Leaf Powder (NLP) @ 2g, alone or in combination /kg of broiler diet as natural feed additives to evaluate the effect of NLP and GRP on performance of broilers. Weekly observations were recorded for live body weight, weekly gain in weight, weekly feed consumption and feed efficiency of birds for four weeks. At the end of research trail, weight gain, feed consumption and feed conversion ratio (FCR) were non-significantly varied. T5 which supplemented with (2g NLP, and

2g NLP+1.25g GRP) per 1kg diet of broiler chicks was recorded (non-significantly) better body weight, weight gain and feed conversion ratio (FCR) than other treatment and control group. The study concluded that supplementation of Ginger Root Powder and Neem Leaf Powder were better economical (non-significant) compared with control.

Introduction:

The phasing out of antibiotic growth promoters (AGP) will affect the poultry and animal industry. To minimize the loss in growth, there is a need to find alternatives to AGP. There are a number of non-therapeutic alternatives such as enzymes, inorganic acids, probiotics,

prebiotics, medicinal plants and other management practices (**Banerjee, 1998**). Medicinal plants have been traditionally used for the treatment of various diseases, in both humans and animals. A number of dietary herbs, plant extracts and essential oils have been studied for their antimicrobial and growth promoting abilities in poultry (**Cross et al, 2007**). Some herbal extracts have also been shown to possess a coccidiostatic activity (**Allen et al., 1997; Tipu et al., 2002; Christakia et al 2004; and Abbas et al., 2006**). Prominent among these plants are ginger (*Zingiber officinale*) and neem (*Azadirachta indica*). Both neem and ginger have gained prominence due to their wide range of properties through improve the nutritive value of the animal product (meat, milk or egg). **Dieumou et al., (2009)** reported that Ginger is a medicinal plant which is widely used all over the world. The main important compounds in Ginger (*Zingiber officinale*) are gingerol, gingerdiol and gingerdione which have the ability to stimulate digestive enzymes, affect the microbial activity. **Tollba (2003); Herawati (2006) and Herawati (2010)** observed the significantly low FCR for birds fed with diets containing ginger up to 2%. *Azadirachta indica*, commonly known as

neem has attracted worldwide attention in recent years, owing to its wide range of medicinal properties. The utilization of several leaf meals as feed ingredient to reduce production cost in poultry diet is not new but the inclusion levels at various ages and physiological conditions varies (**D'Mello and Acamovic., 1987; Udedibie and Opara, 1998**). Various parts of the tree have been reported to contain chemicals like azadiractinn imbin, nimbindin, quercetin among others (**Makeri., et al 2007**), which have antimicrobial, antihelminth, antioxidant antifungal, insecticidal, anti-protozoa and spermicidal (**Elangovan., et al 2000**) properties. The present study was designed to observe the effect of Ginger (*Zingiber officinale*) and Neem (*Azadirachta indica*) alone or in combination as natural feed additives on performance of broiler chickens.

MATERIALS AND METHODS

1. Purchase and distribution of broilers:

Day old 240 broiler chicks (DOC) of same hatch were procured and reared under deep litter system at Broiler Production Unit of the Sanderson School of Animal Husbandry and Dairying SHIATS, U. P, India. The

chicks were weighed, leg banded and distributed randomly in to 5 groups of (48) chicks each treatments. Chicks of each treatment were further divided into 4 sub groups of (12) chicks in each chamber randomly . Chicks of each sub group were housed comfortably in one chamber by providing 1 sq ft per bird. Chicks were fed starter ration up to 3 weeks age (1 to 21 days) and then broiler finisher ration up to 3-4 weeks age (22 – 28 days).

2. Treatments of experiment were as follows:

T0 – (Control) basal diet /standard ration

T1– Feed 1kg + 0.75g Ginger Root Powder

T2– Feed1kg + 1.25g Ginger Root Powder

T3– Feed1kg + 2g Neem Leaf Powder

T4– Feed1kg + 0.75g Ginger Root Powder+2g Neem Leaf Powder

T5– Feed1kg + 1.25g ginger root powder+2g neem leaf powder

The standard broiler starter ration contained CP: 22 and, ME:2900 and broiler finisher ration contained CP: 19 and ME:3000 were fed ad lib to the birds as per BIS (1992).

3-Statistical analysis: The data on various parameters were recorded tabulated and statistically analyzed using analysis of variance (ANOVA) technique as per Snedecar & Cochran (1994) in RBD consisting of five treatments, one control and four replications.

4- Observation Recorded:

1- Weekly mean Body Weight

2- Weekly mean gain in weight

3-Weekly mean feed Consumption .

4- Weekly mean feed Conversion Ratio (FCR)

Table 1 Ingredients and nutrient composition of experimental diet

Ingredients (%)	Broiler starter (0-21 days)	Broiler finisher (22-35 days)
Maize	60.00	63.00
Ground nut cake	23.35	18.00
Fish meal	0.5	0.9
Mineral mixture	3.00	3.00
Common salt	0.05	0.05
Vitamin premix (vit. A, B ₂ ,D ₃)	0.05	0.02
Nutrient composition		
Moisture (%)	6.29	6.22
Crude fibers (%)	5.50	6.00
Total ash (%)	8.02	9.34
Crude protein (%)	22	19
ME (Kcal/kg)	2900	3000

Table (2) Results of growth parameters of broilers.

growth parameter Treatments	Weekly body weight (g)	Weekly gain in weight	feed consumption	Feed conversion	Sig

T0	448.85	218.33	413.96	1.86	NS
T1	471.19	242.98	408.69	1.72	NS
T2	425.50	199.04	392.75	1.82	NS
T3	481.31	220.94	431.37	1.94	NS
T4	431.38	209.69	360.34	1.74	NS
T5	480.60	230.40	402.75	1.69	NS

Results & Discussion

1. Weekly body weight per broiler (g):

Mean weekly body weight of broilers in T0, T1, T2, T3, T4, and T5 was 448.85, 471.19, 425.50, 481.31, 431.38 and 480.60g. The differences in mean weekly body weight of broilers were not significant (Table 2). Highest mean weekly body weight of broilers was recorded in T3 (481.31), followed by T5 (480.60), T1 (471.19), T0 (448.85), T4 (431.38) and T2 (425.50). The broilers in T3, T5 recorded (non-significantly) higher body weight compared with control group (T0).

2. 2-Gain in weight: Mean weekly weight gain of broilers in T0, T1, T2, T3, T4, and T5 was, 218.33, 242.98, 199.94, 220.94, 209.69 and 230.40 g, respectively. The differences in mean weekly weight gain of broilers were not significant. Highest mean weekly body weight of broilers was recorded

in T1 (242.98), followed by T5 (230.40), T3 (220.94), T0 (218.33), T4 (209.69) and T2 (199.94), however the differences in these values of weekly weight gain were found not significant indicating thereby no significant effect of treatments on growth performance of broilers. The broilers in T3, T5, recorded (non-significantly) higher body weight compared to control (T0).

3-Feed consumption weekly: Mean weekly feed consumption of broilers in T0, T1, T2, T3, T4 and T5 was 413.96, 408.69, 392.75, 431.37, 360.35 and 402.75g, respectively. Highest mean weekly feed consumption of broilers was recorded in T3 (431.37), followed by T0 (413.96), T1 (4408.69), T5 (402.75, T2 (392.75) and T4 (360.35), however the differences in these values of weekly feed consumption were found no significant, indicating thereby

non - significant effect of treatments on weekly feed consumption of broilers. The broilers feed consumption were lower in T4, and T2 as compared to control (T0).

4-FCR Mean weekly FCR of broilers in T0, T1, T2, T3, T4 and T5 was 1.86, 1.72, 1.82, 1.94, 1.74 and 1.69g, respectively. The differences in mean weekly FCR of broilers were not significant. Highest mean weekly FCR of broilers was recorded in T3 (1.94), followed-by T0 (1.86), T2 (1.82), T4 (1.74), T1 (1.72), and T5 (1.69). T5 and T1 were recorded better FCR (non-significantly) as compared with T0 (control) group.

Conclusion:

This study revealed that inclusion of GRP and NLP for both starter and finisher broilers had no adverse effects on performance of broiler chicken. Based on body weight, gain in weight. Best performance of broilers was observed in T5 as compared to T0 (control).

References

- [1] **Abbas R.z., Zafar Iqbal., Muhammad Shoaib Akhtar., Muhammad Nisar Khan., Abdul Jabbar and Zia-U-din Sandhu (2006).** Anticocidal screening of *Azadirachta indica* (Neem) in broiler. *Pharmacologyonline* 3: 365-371.
- [2] **Allen, P.C., J. Lydon and H. Danforth (1997).** Effects of components of artemisia annua on coccidian infections in chickens. *Poultry Science*. 76: 1156-1163.
- [3] **Banerjee G .C. (2011).** **Feed additives, (coccidiostats).** Text book of Animal Husbandry, (eighth edition).
- [4] **Christakia, E., P. Florou-Paneria, I. Giannenas, M.Papazahariadoub, N.A.Botsogloua and A.B. Spaisa (2004).** Effects of a mixture of herbal extracts on broiler chickens infected with eimeria tenella. *Animal Research*. 53: 137-144.
- [5] **Cross D. E., R. M. Mcdevitt, K. Hillman and T. Acamovic (2007).** The effect of herbs and their associated essential oils on performance, dietary digestibility and gut micro flora Chickens from 7 to 28 days of age. *British Poultry Science*. 48(4): 496-506.
- [6] **D'mello J P F and Acamovic T. (1989).** *Leucaena leucocephala* in Poultry Nutrition: A review. *Animal Feed Science and Technology* 26:1-28.
- [7] **Dieumou, F.E., A. Teguia, J.R. Kuate,**

- J.D. Tamokou (2009)** Effect ginger (*Zingiber officinale*) and garlic (*Allium sativum*) essential oils on growth performance and gut microbial population of broiler chickens. *Livest. Res. for Rural Dev.*, 21: 25-34.
- [8] **Elangovan, A.V., Verna S.V.S and V.R.B. (2000)**. Sastry, is suggested in order to manage possible injury levels 2000. Effect of feeding neem (*Azadirachta indica*) when fed to birds leaf meal on growth and nutrient utilization. CAB
- [9] **Herawati, (2006)**. Effect of red ginger (*Zingiber officinale* Rosc) phytobiotic addition to the broiler performance and blood profile. Pengaruh Penambahan Fitobiotik Jahe Merah., 14: 173-142.
- [10] **Herawati. (2010)**. The Effect of Feeding Red Ginger as Phytobiotic on Body Weight Gain, Feed Conversion and Internal Organs Condition of Broiler. *International Journal of Poultry Science* 9 (10): 963-967, 2010 ISSN 1682-8356.
- [11] **Koul A., A. R., Ghara and Gangar S. C. (2006)**. Chemomodulatory effects of *Azadirachta indica* on the hepatic status of skin tumor bearing mice. *J. Int. Sci.* 20(3): 1.
- [12] **Makeri. H.K., Maikai V.A. and Nok J.A. (2007)**. Effect of tropical application of neem seed (*Azadirachta indica*) extract on sheep infested with *Amblyomma variegatum*. *African Journal of Biotechnology*, 6(20): 2324-2327..
- [13] **Tipu, M. A., T. N. Pasha and Z. Ali, 2002**. Comparative efficacy of salinomycin sodium and Neem fruit (*Azadirachta indica*) as feed additive anticoccidials in broilers. *Int. J. Poult. Sci.*, 1(4): 91-93.
- [14] **Tollba, A.A., 2003**. Using some natural additives to improve physiological and productive performance of broiler chicks under high temperature conditions. 1--Thyme (*Thymus vulgaris* L.) or fennel (*Foeniculum vulgare* L.). *E. J Egypt Soc Parasitol.*; 40(1):93-106.
- [15] **Udedibie A B and Opara C. C. (1998)**. Responses of growing broilers and laying hens to the dietary inclusion of leaf meal from *Alchornea cordifolia*. *Anim. Feed. Sci. Techn.* 71: 157- 164