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Effects of neem leaf infusion supplementation as a growth promoter in the diet of broiler chicks

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Abstract

A research study was conducted to investigate growth promoting effects of neem leaves' infusion on broilers. Thirty day-old chicks were randomly divided into four groups, designated as group-1, group-2 and group-3. Each group was reared in sided house. Birds of Group-1, Group-2 and Group-3 were given 4% concentrated neem leaves (*Azadirachta indica*) infusion @ of 30ml and 50ml/litter of fresh drinking water respectively and group-3 was kept as control. Mean feed and water intake were higher ($P < 0.05$) in control group as compared to others. The group-2 exhibited better ($P < 0.05$) mean body weight gain, feed conversion ratio (FCR). Also, higher mortality was observed in group-3 as compared to group-1, and group-2. It was found that Neem (*Azadirachta indica*) successfully improved growth performance at the level of 50 ml/litter of fresh drinking water.

Keywords: *Azadirachta indica*, broiler chick, growth promoter, leaf infusion, supplement

Introduction

The parts of neem tree have been reported to contain chemicals like azadiractin, nimbin, nimbindin, quercetin among others which have antimicrobial, anthelmintic, antioxidant, antifungal, insecticidal, antiprotozoal and spermicidal activities [1] properties. *A. indica* is a fast growing evergreen tree which has a potential to provide medicinal and nutritive value to broilers. Broilers given neem leaf extract in water show improved nutrient conversation efficiency and weight gain [2].

Poultry industry has made enormous progress in boosting animal protein in the Indian country. Poultry is one of the most efficient and economical converter of vegetable food into animal protein and provides a quick and rapid outcome. Decreased weight gain, management problems and infectious diseases are major constraints in the poultry sector. Several antibiotics have been in use as growth promoters of farm animals ever since. Most of the commercial poultry growers use antibiotics as growth promoters and to reduce the chance of occurrence of infectious diseases, which usually result in higher costs of production and ultimately lower net returns. *Azadirachta indica*, commonly known as neem, it has wide range of medicinal properties. Neem has been extensively used in Ayurveda, Unani and homoeopathic medicine and has become a cynosure of modern medicine. [3, 4].

The medicinal utilities and wide range of pharmacological activities have been described especially for neem leaf. Neem leaves and its constituents have been demonstrated to exhibit immunomodulatory, anti-inflammatory, antihyperglycaemic, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, antimutagenic and anticarcinogenic properties. [3] The leaves extract contain nimbin, nimbinene, 6-desacetylnimbiene, nimbandiol, nimbolide and quercetin [5].

Based on these medicinal properties a study was planned to explore the effects of neem leaves infusion on the immunity, growth performance and economics of broiler production.

Materials and Methods

This research study was conducted on thirty day-old broiler chicks which were randomly divided into three groups namely, Group-1, Group-2 and Group-3 respectively. All the chicks were reared in a sided house, using separator for separation for each group. Strict sanitation practices were maintained in the house before and during the course of the experiment. Group-1 and Group-2 was given neem infusion @ 30 and 50ml/l of drinking water respectively and Group-3 was kept as control.

Preparation of 4% (w/v) concentrated neem leaves infusion

Neem leaves infusion was prepared. [6] Fresh neem leaves were collected from the local area and dried for 24 h at 37°C in oven. Exposure to sunlight was avoided to prevent the loss of active components. Dry leaves were then ground and 40 g of dried ground leaves were taken in a non-metallic jar. One litter of hot boiled distilled water was poured on it and kept at room temperature for 5-8 h to prepare an infusion.

Data on body weight, feed intake and water intake were recorded. Statistical data analysed by using CRD design. Means were compared using Duncan's multiple- range test. [7]

Results and Discussion

Mean feed intake for Group-1, Group-2 and Group-3 were 2375, 2359 and 2416 g respectively (Table I). Feed intake for Group-3 was significantly ($P<0.05$) higher than Group-1, and Group-2 (Table I). The results of the present study are in similar with Gowda *et al.* [8], who reported significantly lower feed intake ($P<0.01$). On the other hand lower ($P<0.05$) feed conversion ratio for Group-2 as compared to the control and other group (Table I), suggested lower feed consumption supplemented with neem leaves infusion. Chakravarty and Prasad [2] also reported that better feed conversion ratio of broilers fed commercial ration and water containing neem (*A. indica*) infusion than other

Table 1: Mean body weight gain, feed intake, water intake and FCR in broilers given neem leaves extract in drinking water

Group	Neem leaves infusion l ⁻¹ Water (ml)	Mean body weight gain chick ⁻¹ (gm)	Mean feed intake chick ⁻¹ (gm)	Mean water intake chick ⁻¹ (ml)	Mean FCR chick ⁻¹
Group-1	30	1467 ^c	2390 ^b	7243 ^b	1.62 ^c
Group-2	50	1532 ^a	2336 ^b	7053 ^b	1.52 ^a
Group-3	Control	1243 ^d	2463 ^a	7854 ^a	1.98 ^d

Means in column with different superscripts are significantly different at $\alpha=0.05$.

Body Weight Gain

Group-2 had significantly ($P<0.05$) higher body weight gain than rest of two groups (Table I). An increasing trend was found in body weight gain with increased levels of neem leaves infusion. The results of present study are in agreement with the study of Chakravarty and Prasad [2] who reported that broilers fed on diet containing neem (*A. indica*) leaves, had higher body weight gain. Similar findings have been reported by Tipu *et al.* [9], who used salinomycin and neem (*A. indica*) fruit as feed additive and anticoccidial in broilers and reported better results in terms of weight gain. The higher body weight gain in broilers consuming neem leaves infusion could be due to its diversified effect on intestinal micro flora, thereby avoiding stressful conditions [10-11].

Water Intake

Mean water intake is given in Table I. Significantly ($P<0.05$) higher amount of water was consumed by broilers in group 3 than in group 1 and 2. However, differences in water intake amongst group 1, 2, and 3 were not significant (Table I). The lower amount of water consumption in treated groups could be due to some metabolic effects of the neem infusion that needs to be figured out for more profitable production. [12]

Conclusion

In this study it is concluded that 4% neem leaves infusion @ 50ml l⁻¹ of fresh drinking water could be effectively used as a natural growth promoter contributing to better body weight gain, FCR.

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