

## Effects of neem leave powder as a growth promoter in broilers

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### ABSTRACT

The efficacy of neem leaves powder as a growth promoter on the performance of broilers was determined in this study. Broiler chicks of 01 day old were divided into four groups, I<sub>0</sub>, I<sub>1</sub>, I<sub>2</sub> and I<sub>3</sub> which were supplemented with neem leaf powder @ 0gm, 1gm, 2gm and 3gm/kg of broiler ration, respectively. Weekly observations were recorded for live body weight, weight gain, feed consumption, feed efficiency and blood parameters of birds for six weeks. All the treated groups I<sub>1</sub> (810.01±276.93), I<sub>2</sub> (850.06±264.50) and I<sub>3</sub> (844.11±260.94) showed significantly (P<0.01) higher means for live body weight than that of control I<sub>0</sub> (768.69) group. The weekly weight gain, feed consumption and feed efficiency of all treated groups were non significant compared to that of control group. The study suggests the potential use of neem leaf powder to improve the growth of broiler.

**Key words:** Broilers, neem leave powder, growth promoter.

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### INTRODUCTION

The poultry production systems have led to marked increase in the production of poultry meat and eggs throughout the world (Armstrong, 1986). It has triggered the discovery and widespread use of a number of “feed additives”. The term feed additive is applied in a broad sense, to all products other than those commonly called feedstuffs, which could be added to the ration with the purpose of obtaining some special effects (Feltwell and Fox, 1979). The main objective of adding feed additives is to boost animal performance by increasing their growth rate, better-feed conversion efficiency, greater livability and lowered mortality in poultry birds. These feed additives are termed as “growth promoters” and often called as non-nutrient feed additives (Singh and Panda, 1992). Many synthetic drugs and growth promoters are supplemented to the broilers

to effect rapid growth, but their use have shown many disadvantages like high cost, adverse side effect on health of birds and long residual properties etc. Growth promoters are chemical and biological substances, which are added to livestock feed with the aim to improve the growth of chickens in fattening, improve the utilization of feed and in this way realize better production and financial results. Their mechanism of action varies. Positive effect can be expressed through better appetite, improved feed conversion, stimulation of the immune system and increased vitality, regulation of the intestinal micro-flora, etc. In any case, expected results of the use of these additives are increased financial effects of production. Because of the fact that growth promoters have different mechanisms of action, it is necessary to present every group individually and present the effect, which can be expected with their utilization. With the development and wide

use of synthetic and semi-synthetic antibiotics, pros and cons have been experienced throughout the last 50 years, which have been directed research back to natural antimicrobial products as indispensable resources. Consequently there is considerable research interest in the possible use of natural products, such as essential oils and extracts of edible and medicinal plants, herbs and spices, for the development of new additives in animal feeding.

Scientists are again concentrating on the use of our ancient medicinal system to find beneficial herbs and plants, which can be safely used to increase the production. Many plants also produce secondary metabolites such as phenolic compounds, essential oils and saponins (Chesson et al., 1982; Wallace et al., 1994; Kamel, 2001). Herbs normally used are picorhiza, garlic, cloves, slippery elm, neem fruit and leaves, sophora flavescens, nutmeg, cinnamon, ginger, peppermint, sage, thyme, mustard and fenugreek. These plants are used as digestive stimulants, antidiarrhoic, antiseptic, anti-inflammatory, antiparasitic and appetite stimulants in human beings as well as animals. It is conceivable that herbal agents could serve as safer alternatives as growth promoters due to their suitability and preference, lower cost of production, reduced risks toxicity and minimum health hazards. One of such plants, neem (*Azadirachta indica*) is an indigenous plant of Asian subcontinent known for its useful medicinal properties like antibacterial, antiviral, antifungal, antiprotozoal, hepatoprotective, immunomodulator and various other properties without showing any adverse effects (Kale et al., 2003; Sadekar et al., 1998). Neem promotes growth and feed efficiency of birds because of its antibacterial and hepatoprotective properties (Padalwar, 1994). Neem preparations fed to laying hens have been reported by Sadre et al., (1984) and Gowda et al., (1998) to significantly reduce the content of hemoglobin, erythrocyte count and packed cell volume. Recent biological trials of certain herbal formulations in India as growth have shown encouraging results and some of the reports have demonstrated improvement with respect to weight gain, feed efficiency, lowered mortality, increased immunity and increased livability in poultry birds (Kumar, 1991). Neem (*Azadirachta indica*) dry leaves powder as medical herbs could

be beneficial in immunosuppressant diseases of poultry. The feeding neem leaves to immunosuppressed birds increase their humoral and cell mediated immune responses (Sadekar et al., 1998). Low dose of neem leaves powder have an inhibitory action on wide spectrum of microorganisms (Talwar et al., 1997) and immunomodulator actions that induce cellular immune reaction (Devakumar and Suktt, 1993). Considering the vast benefits of neem on poultry health and management the present study was aimed to evaluate the growth performance of broilers supplemented with neem leaf powder.

## MATERIALS AND METHODS

### Preparation of plant material

For the preparation of neem powder, the leaves were dried in sun for 10 days, and then dried in oven at 55-60°C for 2 days. The dried leaves were pulverized with a blender. A 25mm mesh diameter sieve was used to obtain the fine dust, after then dust was preserved in airtight plastic container until they were directly used for screening and preparation of alcoholic extract.

### Treatment of birds

Broiler chicks of 01 day old were randomly selected and allowed to acclimatize for 7 days in the experimental shed. The body weights (b.wt.) of assigned chickens were recorded. During acclimatization the chicken were supplied with recommended feed and water.

All the 40 broilers were randomly divided into 4 groups (I<sub>0</sub>, I<sub>1</sub>, I<sub>2</sub> and I<sub>3</sub>) for assessing the efficacy of neem powder as growth promoter on broilers. Broiler of group 'I<sub>0</sub>': was kept as control and was not treated, group 'I<sub>1</sub>', 'I<sub>2</sub>' and 'I<sub>3</sub>' were treated with neem leaf powder @ 1gm, 2gm and @ 3gm by dropper for consecutive six weeks.

### Data collection

The effect of the neem leaves powder on body weight, feed consumption and water consumption was recorded before and after treatment at weekly interval. Blood samples were collected from neck vein of chicken of both control and treated groups

at 7 days interval. The total erythrocyte count (TEC), hemoglobin estimation (Hb), packed cell volume (PCV) and erythrocyte sedimentation rate (ESR) were calculated according to the methods described by method described by Lamberg and Rothstein (1977). Finally, 3 birds from each group were slaughtered to see if there were any pathological changes present on 7<sup>th</sup> day, 35<sup>th</sup> day, 42<sup>nd</sup> day of treatment.

### Statistical analysis

Student's T test was performed to measure the difference between control and treated groups of chicken.

## RESULTS AND DISCUSSION

### Effect of neem (*Azadirachta indica*) leaf powder supplementation on growth in broilers

The supplementation of neem leaf powder (1-3 gm/kg) in I<sub>1</sub>, I<sub>2</sub> and I<sub>3</sub> groups of broilers significantly ( $p < 0.01$ ) increase mean live body weights as compared to control (I<sub>0</sub>) group (Table 1). The weekly gain in weight (gm) for I<sub>0</sub>, I<sub>1</sub>, I<sub>2</sub> and groups were  $279.20 \pm 49.04$ ,  $306.31 \pm 56.33$ ,  $311.80 \pm 50.70$  and  $310.30 \pm 51.71$  respectively. Similar observation was found in the study of Manwar et al. (2005) who supplemented neem leaf powder @ 1-2 gm/kg feed and reported significant increase in the live body weight of broilers in the neem fed groups when compared with control group. Similarly, Nemade and Kukde (1993) reported increase in feed efficiency in neem fed groups. In another study highest body weight gain and best feed conversion ratio was found as compared to control when offered neem leaf extract to broilers from 1 to 6 weeks (Chakravarty (1991). However, birds supplemented with neem leaf powder had higher body weight, weekly gain in weight, feed consumption and feed efficiency. These results may be due to antimicrobial and antiprotozoal properties of neem leaves, which help to reduce the microbial load of birds and improved the feed consumption and feed efficiency of the birds (Kale et al. 2003).

Post mortem result revealed that there was no significant pathological change in any internal organs of the chickens of treated groups.

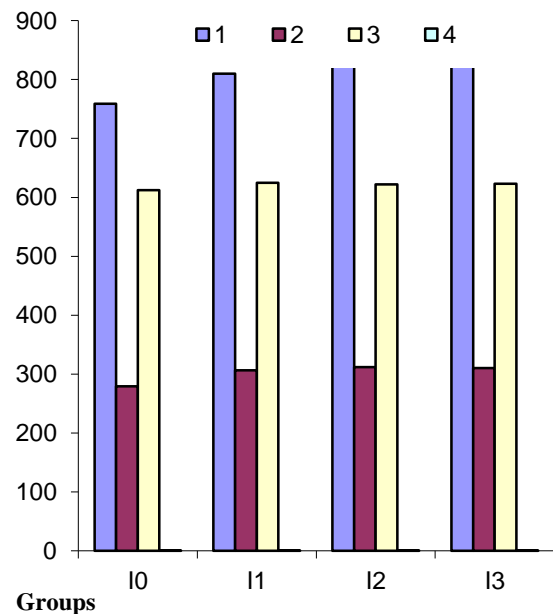


Figure 1  
Effect of neem leaves powder on body weight gain and feed consumption in broiler.

### Effect of neem leaf on hematological parameter of broiler

Observation of hematological parameter (RBC, Hb, PCV, ESR) on 21<sup>st</sup> day and 42<sup>nd</sup> day did not show any significant difference ( $P < 0.05$ ) between the control and treated groups (Table 2).

The effect of neem powder supplementation on the hematological effects in chicken is supported by the works of Wankar et al, (2009), Nagalakshmi et al, (1996) and Gowda et al, (1998) where neem bitters possess a strong influence on hemotological traits particularly PCV and Hb of subjects, depending on their nutritional status.

The study suggests the potential use of neem leaf powder to improve the growth of broiler. However, further studies are needed to evaluate the use of neem powder as an alternative growth promoter without having any harmful effect on human health.

Table 1  
Effect of neem leaves powder on body weight gain and feed consumption in broilers.

Parameters	I <sub>0</sub>	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>
Live body weight	758.69±248.20	810.01±276.93*	850.06±264.50*	844.11±260.94*
Weekly gain in weight	279.20±49.04	306.31±56.33	311.80±50.70	310.30±51.71
Feed consumption	612.01±130.73	625.01±131.16	622.30±188.30	623.33±146.80
Feed efficiency	0.500±0.031	0.517±0.043	0.541±0.043	0.531±0.040

\*indicate significant (p<0.5)

Table 2  
Study of neem leaf on hematological parameter of broiler.

Neem	Parameters	Treatment	Mean	Std. error Mean
21 <sup>st</sup> day	RBC	Neem	199.33	7.54
		Control	192.33	6.36
	Hb	Neem	6.47	0.07
		Control	6.00	0.12
	PCV	Neem	18.00	0.58
		Control	17.33	0.88
ESR	Neem	8.67	0.88	
	Control	10.67	0.88	
42 <sup>nd</sup> day	RBC	Neem	299.67	12.12
		Control	247.67	13.87
	Hb	Neem	7.60	0.20
		Control	6.93	0.24
	PCV	Neem	20.67	0.33
		Control	18.00	0.58
ESR	Neem	5.00	1.00	
	Control	7.00	0.58	

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