

EFFECT OF HERBAL POWDERS AS FEED ADDITIVES ON THE PERFORMANCE AND SERUM CHOLESTEROL LEVEL IN BROILER CHICKEN

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ABSTRACT

A feeding trial with one hundred and eighty straight run commercial broiler chicks was conducted to study the effects on supplementation of five different herbal powders at 0.5% level as feed additives on the performance as well as serum cholesterol level. The chicks were randomly allotted to six dietary treatment viz. T₀ (Basal diet), T₁ (Basal diet plus 0.5% *Mentha arvensis* powder), T₂ (Basal diet plus 0.5% *Ocimum sanctum* powder), T₃ (Basal diet plus 0.5% *Embilica officinalis* powder), T₄ (Basal diet plus 0.5% *Azadirachta indica* powder) and T₅ (Basal diet plus 0.5% *Spilanthes paniculata* powder) groups with three replicates of ten chicks in each and reared on deep litter system under standard management condition up to 42 days of age. Significantly ($P < 0.05$) higher body weights were recorded in *Azadirachta indica* (T₄) supplemented group at 5th and 6th weeks compared to control group (T₀). Significantly ($P < 0.05$) lower serum cholesterol levels were also recorded in *Embilica officinalis* (T₃) and *Azadirachta indica* (T₄) supplemented groups compared to control group (T₀).

Key words: Herbal powder, feed additives, performance, serum cholesterol, broiler chicken.

The main objective of adding feed additives in poultry ration is to boost the performance by increasing their growth rate, better feed conversion efficiency, and to lower mortality. During the past years the interest in the potential use of herbal feed additives has considerably increased. The prohibited use of antibiotic growth enhancers also necessitates considering alternatives that may help to support the immune function and health status in poultry birds. Therefore, an attempt was made to evaluate the effect of some herbal powders as feed additives in commercial broiler ration.

MATERIALS AND METHODS

One hundred and eighty numbers of day-old Vencob broiler chicks were randomly allotted to six dietary treatment groups (n=30 each) viz. T₀ (Basal diet), T₁ (Basal diet plus 0.5% *Mentha arvensis* leaves powder), T₂ (Basal diet plus 0.5% *Ocimum sanctum* leaves powder), T₃ (Basal diet plus 0.5% *Embilica officinalis*

fruits powder), T₄ (Basal diet plus 0.5% *Azadirachta indica* leaves powder) and T₅ (Basal diet plus 0.5% *Spilanthes paniculata* leaves powder) with three replicates of ten chicks in each. The chicks were weighted individually at the start of the experiment and reared on deep litter system under standard management condition with *ad libitum* feed and water up to 42 days of age. Feed intake and body weights for the groups were recorded weekly and corrected appropriately for mortality to derive weight gain and feed conversion ratio (FCR). At the end of 42 days, blood samples were collected from two birds in each replicate for estimation of serum cholesterol. Prior to blood collection from brachial vein, the birds were fasted for 12 hours and gently restrained to minimize the stress of handling. Total serum cholesterol was estimated by using commercial cholesterol kit (CHOD/PAP method) from Crest Biosystems, India as per the protocol supplied with the kit. The data thus obtained were analyzed statistically as per standard method⁶.

RESULTS AND DISCUSSION

1. **Body weight:** Significantly ($P < 0.05$) higher body weights were recorded in *Azadirachta indica* (T₄) supplemented group at 5th and 6th weeks compared to control group (T₀) (Table 1). The increase in body weight in *Azadirachta indica* leaf powder supplemented group

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Table 1: Performance and serum cholesterol levels of broiler in treatment groups

Traits	Treatment groups					
	T ₀	T ₁	T ₂	T ₃	T ₄	T ₅
1 st wk B. Wt (g)	101.11±2.95	103.75±2.75	100.00±1.67	103.45±2.79	101.46±1.34	104.07±1.41
2 nd wk B. Wt (g)	249.62±18.63	249.32±18.15	250.00±19.13	249.83±18.60	250.63±18.84	256.47±7.93
3 rd wk B. Wt (g)	558.68±13.30	557.41±10.44	559.26±9.23	558.93±11.57	563.62±7.31	564.34±9.29
4 th wk B. Wt (g)	874.81±21.65	863.70±22.71	873.52±18.82	875.00±19.90	842.88±16.88	862.12±19.54
5 th wk B. Wt (g)	1375.96±121.42	1381.33±127.80	1415.19±129.47	1346.43±123.70	1527.69±128.04	1457.69±179.70
6 th wk B. Wt (g)	1826.52±22.40	1925.93±27.40	1935.19±20.12	1876.79±33.38	1955.07±130.39	1915.37±43.60
Cumulative FCR	2.00±0.06	2.06±0.07	2.10±0.06	1.96±0.03	2.13±0.12	2.07±0.04
Mortality (%)	13.33±3.33	10.00±5.78	10.00±5.78	6.67±6.67	13.33±6.67	13.33±1.93
Serum cholesterol (mg/dl)	183.83±19.88	173.33±16.20	153.50±16.27	122.33±9.90	124.67±9.96	168.17±17.85

Means with at least one common superscript in a row do not differ significantly (P<0.05)

T₀: Control, T₁: Mentha arvensis, T₂: Ocimum sanctum, T₃: Emblica officinalis, T₄: Azadirachta indica, T₅: Spiranthus paniculata

might be due to increased immune status of birds, resulting better feed conversion, as reported by other workers¹. Moreover, *Azadirachta indica* leaf powder can be safely incorporated in the broiler ration at 1-3 g/kg without causing adverse effect on the haematobiochemical parameters². The body weights of broilers in other herbal powder supplemented groups were also higher compared to control group, although the differences were statistically non-significant (Table 1). The results of the present study were supported by the findings of other workers³.

2. Feed Conversion Ratio: Cumulative FCR at the end of 6th week was lowest in *Emblica officinalis* (T₃) supplemented group compared to other groups, although other treatment groups showed the variable results compared to control group and the differences were statistically non-significant (Table 1). Fruit of *Emblica officinalis* is an important dietary source of ascorbic acid, minerals, amino acids, tannins and phenolic compounds⁴. The better FCR recorded in *Emblica officinalis* (T₃) supplemented group might be due to the hepato-protecting activity which resulted into improvement in the liver function. Moreover, vitamin C content in *Emblica officinalis* fruits alleviates the adverse effects of stress by decreasing synthesis and secretion of corticosteroids⁵.

3. Mortality: There were no significant differences in mortality among the treatment groups, although lowest mortality was recorded in *Emblica officinalis* (T₃) supplemented group (Table 1). The lower mortality recorded in the present study might be due to antistress

effect of *Emblica officinalis*. It was reported that supplementing broiler diet with amla powder at 0.5% or higher level could act as antistress agent in broiler chicken production⁶.

4. Serum cholesterol: Significantly (P<0.05) lower serum cholesterol levels were recorded in *Emblica officinalis* (T₃) and *Azadirachta indica* (T₄) supplemented groups compared to control group (T₀) (Table 1). It is mentioned⁷ that the dietary supplementation of *Emblica officinalis* (amla) significantly reduced the blood cholesterol level in Vanaraja chicks. This finding was also in agreement with other works⁸ using neem seed cake. The total serum cholesterol levels were also lower in other supplemented groups compared to control group, but the differences were statistically non-significant. Similar trend of results were also reported by other workers⁹.

CONCLUSION

The overall result in the present study indicates that the *Emblica officinalis* and *Azadirachta indica* powders can be used as feed additives at 0.5 per cent level for enhancement of growth performance as well as to reduce serum cholesterol for quality broiler meat production.

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