

Role of Ayucal Liquid in improving overall performance and tibial mineralisation in broilers

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Abstract

An experiment was planned with an aim to study the efficacy of herbal supplement of calcium and phosphorous, Ayucal Liq. (supplied by Ayurved Ltd. Baddi, India) in 96 commercial day old broiler chicks at college of Veterinary and Animal sciences, Bidar, KVAFSU, Karnataka, India. Day old chicks were randomly divided to two groups (One control and one treatment) comprising three replicates per treatment of 16 birds each. Group A served as control and was supplemented with basal diet without any additional source of calcium and phosphorous. Group B was administered with Ayucal Liq. @ 10ml/100birds/day for duration of five weeks, respectively. Parameters evaluated were growth, performance, and serum biochemical after 3rd and 5th week & tibial mineralisation after 5th week. Body weight gain and FCR was significantly higher in the treated group as compared to control. Among biochemical parameters serum Ca, P, Cholesterol, Serum alkaline phosphatase were found to be improved in treated group as compared to control group. Tibial mineralisation was significantly better in treated group than control. It can be concluded that supplementation of Ayucal Liquid is efficacious in enhancing bioavailability of Ca & P, thereby improving overall performance & bone mineralisation.

Keywords: Broiler, Mineral, Calcium, Phosphorus, Supplementation.

Introduction

Rapid growth, efficient feed conversion and low mortality rate are the prerequisite for a successful poultry enterprise. The importance of calcium and phosphorus in poultry is quite obvious, as they constitute the major part of the mineral contents of the bones. Calcium and phosphorus are very closely related to each other, and the deficiency or excess of one can interfere with the proper utilization of the other. Calcium is needed for the ossification of bones, activation of several enzymes, transmission of nerve impulses, controlling transmembrane trafficking of various proteins, permeability of membranes, etc (Coles, 1986). Likewise, phosphorus is an important constituent of bones, nucleic acids and phospholipids. Now-a-days a number of calcium supplements are available in the market to enhance the performance of broilers. Therefore the present study was undertaken to evaluate efficacy of supplementation of herbal formulation in improving performance & bone mineralisation in broilers.

Material and Methods

An experimental study was conducted in 96 commercial day old broiler chicks at College of

Veterinary and Animal sciences, Bidar, KVAFSU, Karnataka, India. Day old chicks were randomly divided to two groups (One control and one treatment) comprising three replicates per treatment of 16 birds each. Group A served as control and was supplemented with basal diet without any additional source of calcium and phosphorous. Group B was administered with Ayucal Liq. @ 10ml/100birds/day alongwith water for duration of five weeks, respectively. Both control & treatment groups were fed with similar basal broiler starter and finisher mash comprising 2950 Kcal/kg & 3050 Kcal/kg metabolizable energy and 22.15 % and 20.20 % protein content, respectively. Parameters evaluated were growth, performance, serum biochemical after 3rd and 5th week & tibial mineralisation after 5th week. Among biochemical parameters, serum Calcium (Ca), Phosphorus (P), serum total proteins, Alkaline Phosphatase (ALP) and serum cholesterol were estimated as per the analysis methods by Fiske et. al. (1925); Clark and Collip (1925); Mukharjee (1989); Zlatkis et. al. (1953) and King et. al. (1951).

Results and Discussion

The results of weekly body weights, weight gain and FCR are presented in Table 1 and 2. It can be

Table 1: Effect of supplementing Ayucal Liquid on average weekly body weight of broilers

Age (weeks)	Body weight (grams)	
	A	B
0	43.41±1.23a	42.78±1.87 a
1	160.50±0.99 a	163.65±1.59 a
2	451.12±0.87 a	462.70±0.98b
3	836.09±2.13 a	869.79±1.26b
4	1235.59±1.42 a	1285.00±1.66b
5	1824.06±1.67 a	1901.93±2.01b

Table 2: Effect of supplementing Ayucal Liquid on weekly body weight gain and FCR in broilers.

Age (weeks)	A			B		
	BWG	FC	FCR	BWG	FC	FCR
1	117.09	129.64	1.10	120.87	131.21	1.08
2	290.62	349.75	1.20	299.05	344.03	1.15
3	384.97	575.75	1.49	407.09	551.00	1.35
4	399.50	801.56	2.00	415.21	796.33	1.91
5	588.47	1015.62	1.72	616.93	1016.12	1.64
Total	1780.65	2872.32	1.61	1859.15	2838.69	1.52

BWG: Body weight gain, FC: Feed consumption, FCR: Feed conversion ratio

ascertained from these figures that there is considerable increase in body weights of treated broiler from 3rd to 5th week as compared to birds of control group fed basal diet. The body weight at the end of 5th week was significantly ($P=0.05$) higher in treated group B (1901.93±2.01g) than control group A (1824.06±1.67g). The feed intake exhibited no significant difference in treated bird when compared with untreated broilers however, FCR of treated group (1.52) supplemented with Ayucal Liq. was significantly ($P=0.05$) higher than control (1.61). This increase in body weight gain & better FCR can be correlated with the role of constituent herbal ingredients in Ayucal Liq. that might have enhanced the bioavailability of calcium (Ca) and phosphorus (P), important for bone and muscle building and thereby increase in body weight. The enhanced weight gain ultimately must have led to superior FCR in treated broilers.

The results of biochemical profile at 3rd and 5th week are presented in table 3. It is observed that there is considerable increase in Ca, P, total protein and alkaline phosphatase (ALP) levels in the serum of birds offered Ayucal Liq. as compared to control. In contrast, the serum cholesterol of treated group was significantly ($P=0.05$) lower than control. The results in present study are in corroboration with those reported by Jadhav et al., 1990 The enhanced bioavailability for Ca & P in treated birds can be well correlated to the active individual ingredients of Ayucal Liq. namely *Cissus quadrangularis*, *Lepidium sativum*, *Terminalia arjuna*,

Uraria picta and many more are scientifically well known to possess Ca & P mineralization properties (Ashan et al., 1989). The findings on weight, length and width of tibia (Table-4) also recorded notable improvement indicating added benefits in herially treated broilers when compared with untreated control group. The significant improvement in tibial mineralisation may be attributed to the absorption enhancing ability of the synergistic herbs, included in the formulation. These ingredients herbs have been documented to increase the uptake & utilization of dietary calcium and phosphorus, to optimize the serum levels of calcium and phosphorus and to regulate their mobilization from the skeletal system (Deka et al., 1994; Prasad et al., 1965), thus ensuring the better availability of the nutrients. Hence, based on the present findings, it may be concluded that Ayucal liquid can be supplemented to broilers to improve its production performance & bone mineralisation.

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Table 3: Effect of supplementing Ayucal Liq. on biochemical parameters in broilers at 3rd & 5th week

Parameter	Group A		Group B	
	3rd Week	5th Week	3rd Week	5th Week
Serum Ca (mg/dl)	7.68±1.01a	8.67±1.22a	8.20±1.03b	9.30±1.03b
Serum P (mg/dl)	3.97±2.25a	4.10±1.31a	4.23±1.28b	4.90±1.26b
Total serum protein (g/dl)	6.63±0.93a	7.18±1.95a	7.15±1.63b	7.94±1.30b
Serum cholesterol (mg/dl)	248±1.28a	242±1.07a	232±2.09b	218±1.07b
Serum alkaline phosphatase (IU/L)	390±1.74a	408±1.56a	425±1.08b	464±2.01b

Mean bearing different superscript differ at P=0.05

Table 4: Effect of supplementation of Ayucal Liq. on tibial mineralization after 5 weeks in broilers

Trait	Treatment Groups	
	A	B
Weight (g)	11.29±1.56a	13.26b
Length (cm)	9.34a	9.69a
Width (mm)	6.82a	7.39b

Mean bearing different superscript differ at P=0.05

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