

Beneficial effects of *Superliv DS* and *Xlivpro* on growth promotion and carcass quality traits in broilers

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Abstract

An experimental study in 180 day-old broiler chicks was conducted to evaluate efficacy of herbal liver tonic & growth promoter products on overall growth, performance and carcass quality parameters. Day old chicks were randomly divided into three groups, control group I was given no treatment while group II & III were administered herbal liver tonic & growth promoter products Superliv DS & Xlivpro respectively, from 0 to 6 weeks. A significant ($P < 0.05$) improvement in growth performance traits was observed in treated groups. The results also indicated significant ($P < 0.05$) and notable improvement in livability, overall carcass yield & carcass quality parameters. The administration of polyherbal liver tonic formulations enhanced nutrient utilization and boosted overall economy of broiler raising by reducing mortality, increasing livability & carcass quality.

Keywords: Broiler, performance, economy, herbal liver tonic, carcass quality, livability

Introduction

It is well known that the feeding cost alone constitutes about 60-70% of the total cost of production. Any effort to improve feed efficiency will go a long way to improve profit margins of dairy farmers. An efficient feed utilization and its conversion to egg & meat is essential. This can be achieved by supplementation of certain growth promoters & liver tonics alongwith basal feed. Liver is the key organ involved in various metabolic pathways regulating growth & productivity in poultry. The variety of functions performed by the liver makes it vulnerable to a wide variety of metabolic, toxic, microbial, circulatory and neoplastic diseases. In recent years, some of the herbal preparations have been reported to possess hepatogenic, hepato-protective and growth stimulating properties which tones up liver resulting in to better overall performance and higher profitability due to increased efficiency of feed utilization (Ather, 1999; Bhasker et al., 2003). These products have also been indicated to exert immunomodulatory action which confers bird with better immune response for various diseases, disorders and tolerance against toxins leading to lower mortality, morbidity, enhanced productive adaptability (Panda & Chawak, 1996). This study was undertaken for investigating the effects of Superliv DS & Xlivpro (herbal liver stimulants) on

growth performance & carcass quality of commercial broiler chicks in well managed poultry farm in the vicinity of G. B. Pant University of Agriculture and Technology, Pantnagar, Uttaranchal, in 2007.

Materials and Methods

One hundred and eighty day old unsexed commercial broiler chicks of Vencobb strain of University Poultry Farm, GBPUAT, Pantnagar were divided randomly into three identical groups, each with 3 replicates. Each replicate containing 20 birds. All the groups were administered commercially purchased corn-soyabeanmeal based starter & finisher ration as per the NRC requirements. Nutrient composition of experimentally offered diet is given in table No.1. Control group was given basal diet & no treatment whereas Superliv DS @ 250 g/tonne (supplied by M/S Ayurved Ltd., Baddi) & Xlivpro @ 250 g/tonne of feed (supplied by M/S Ayurved Ltd., Baddi) was added in basal diet offered to treatment groups II & III, respectively (from 0-6 weeks). All the groups alongwith replicates were housed in a brooder cum grower house under identical managemental, nutritional and environmental conditions. Feed and water were offered *ad libitum* throughout the experimental period. All the chicks were vaccinated as per routine farm practices. For each group of birds

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(I to III), individual body weight was recorded at the time of grouping at 0 day followed by recording at weekly intervals. Other parameters; average feed intake, feed conversion Ratio (FCR), average body weight gain, mortality and incidence of fatty liver syndrome were recorded at weekly intervals throughout the experimental period. Livability, dressing & eviscerated percentage were calculated by slaughtering representative birds per group at the end of experimental trial. Organ weight (heart, liver and spleen) was also recorded for all the representative birds of each group. The meat color score was determined 45 minutes (at the moment of slaughter) and 5 hours after slaughter on a 5-point scale (color score of 3 or more acceptable). The pH was recorded using a digital pH meter directly in breast muscle. The measurements were done immediately after slaughter (45 minutes) and 5 hours after slaughter in chilled carcasses.

Results and Discussion

Results reveal that feed intake and body weight gain in the control group was significantly lower ($P < 0.05$) as compared to two treatments. Superliv DS treated group II had the maximum final body weight of 1614gm followed by Xlivpro (1589) than untreated control group (1492 gm) after 6 weeks. Superliv DS & Xlivpro treated groups had significantly ($P < 0.05$) better feed utilization efficiency as indicated by FCR values (Table 2, fig. 1) in comparison to control group indicating efficacy of liver stimulants in improving gut function, nutrient assimilation & utilization. Mortality was comparatively lower in treated groups, 4.2% and 6% in group II & III as compared to untreated control (8.8%) (table: 2). Thus, the livability in the treated group was higher and an additional profit was attained since, 3-4 % more broilers were available for sale at marketing age. At the end of experiment, evaluation of carcass & meat quality parameters on slaughtered representative birds revealed that both the treatment groups had higher dressed and eviscerated percentage, 3-6 % more edible meat yields as compared to control (Table: 3). The values of meat colour scores measured on 5-point scale revealed that meat colour 45 minutes post slaughter were more desirable in the treated groups as compared to control indicating that herbal ingredients had significantly prevented color loss of meat thus improving meat quality & overall acceptability. Almost similar trend was seen for the meat colour scores post 5 hr slaughter in both the treatment groups. Significantly lower values of pH was observed at both stages (post 45 minutes & 5 hr post slaughter) in treated groups suggesting that some of the constituent herbs had successfully inhibited lipid peroxidation of meat leading to better quality and

enhancing the shelf life of meat. The lighter meat colour and the lower pH in the meat of the treated group chickens may demonstrate negligible lipid peroxidation and higher level of glycogen the live chickens had in the muscles as well as a faster rate of glycolysis. Meat colour and pH are important parameters associated with keeping quality and shelf life of meat products. Difference in organ weight (heart & liver) was found to be significantly different in treated groups than control. The study revealed that supplementation of herbal liver tonics has promoted the efficacy of liver & heart and have protected the organs from any damage. As a result organs were prevented from any enlargement & inflammation. The herbal ingredients of Superliv DS & Xlivpro such as *Andrographis paniculata*, *Eclipta alba*, *Picorhiza kurroa*, *Phyllanthus niruri*, *Tephrosia pururea*, *Tinospora cordifolia* and *Boerhaavia diffusa* have been well documented to have hepatoprotective and hepatostimulant activity by different authors (Mehra & Handa, 1978; Dwivedi et al., 1986; Peer et al., 1990). These constituent herbs optimizes digestion and metabolism, in turn leading to better protein utilization, improved mucosal function and reduced cost of metabolic deamination. Bioactive compounds in *Andrographis paniculata*, *andrographolide* and *14-deoxy-11, 12-didehydroandrographolide* are also scientifically validated to exhibited lipid peroxidation inhibition and free radical activities (Visen et al., 1993; Trivedi et al., 2001). Arabinogalactan polysaccharide isolated from *Tinospora cordifolia* is established to be a potent free radical scavenger (Stanley et al., 2001). Inhibition of lipid peroxidation in meat prevents free radical production improving shelf life in addition to preserving meat colour & composition. It can be concluded that supplementation of Herbal liver tonics: Superliv DS and Xlivpro at dose rate 250gm/tonne of feed was found to be beneficial in significantly improving overall growth, performance, feed efficiency, nutrient utilization, meat & carcass quality of chicken in addition to enhancing the shelf life which can be attributed to the potent and efficacious active principles present in individual herb constituent of polyherbal liver tonic formulation.

Table-1: Nutrient composition of experimental diet offered to experimental birds

Nutrient	(%)
DM	96.5
OM	89.94
CP	20.32
TA	06.70
CF	03.91
EE	02.52
NFE	66.55

Table-2: Comparative Performance of birds under three different experimental diets.

Groups	Final Body Weight (gm)	Total Feed Consumption (gm)	FCR	Overall mortality (%)
I	1492	3029	2.03	8.8
II	1614 ^a	3002 ^a	1.86 ^a	4.2 ^a
III	1589 ^a	3081 ^a	1.95 ^a	6.0 ^a

Mean with superscripts are significantly different at 5% level of significance

Table-3: Meat & Carcass quality parameters of birds in control and treated (herbal liver tonics) groups

Groups	Dressing% Wt%	Eviscerated Heart	Organ Wt (gm)			Meat Colour score		Meat pH	
			Liver	Spleen	45 min	1.5 hr	5 hr		
I	71.83	62.44	0.56	2.54	0.16	4.6	4.4	5.63	5.84
II	77.38 ^a	66.12 ^a	0.52 ^a	2.28 ^a	0.14	4.9 ^a	4.6	5.55	5.6
III	76.58 ^a	64.88 ^a	0.52 ^a	2.45	0.14	4.9 ^a	4.6	5.56	5.7

Mean with superscripts are significantly different at 5% level of significance

Acknowledgements

Authors are thankful to Staff of University Poultry Farm, GBPUAT, Pantnagar and Dean, Veterinary College, Pantnagar for providing necessary facilities.

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