WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 10, 1108-1114. Research Article ISSN 2277– 7105

LIVON AS THE REPLACEMENT OF SYNTHETIC LIVER TONIC EFFICIENTLY AS EVIDENT BY COMPARABLE BIRD'S GROWTH, VIABILITY, HYPOCHOLESTEROLEMEIC EFFECT

Arvind Sharma[1]*, Shashi Ranjan[1] and Meena Bakshi[2]

[1]Orbit Bioscience, 22, Raipur District Haridwar 247661, India.

[2]Forest Research Institute, Dehradun 248001, India.

Article Received on
14 July 2017,
Revised on 04 August 2017,
Accepted on 24 August 2017

DOI: 10.20959/wjpr201710-9455

***Corresponding Author**
Dr. Arvind Sharma
Orbit Bioscience, 22, Raipur District Haridwar 247661, India.

ABSTRACT

Supplementation of liver tonic in poultry ration is well established to improve growth, performance & to regulate lipid metabolism. Organic poultry is a relatively new expression in Western and Asian countries which is going to expand in other countries also. In this kind of poultry method, farmers do not use chemical compounds at all or in a very low level for the sake of farmers. In the present study treatment group T_L was fed with basal diet supplemented with polyherbal formulation Livon while treatment group Tc was fed with basal diet supplemented with combination of synthetic liver tonic as recommended dosage. Growth & performance parameters were recorded at 21 and 35 days and a metabolic trial for nutrient retention studies was conducted at the end of study. A significant increase in mean body weight gain and mean final body weight was observed in both the treated groups as compared to untreated control. Many researchers have shown that herbal liver tonic can replace synthetic liver tonic for poultry, swine and livestock. The objective of this study was to evaluate the use of Livon to replace synthetic liver tonic for broilers from one to 21 and from 22 to 35 days of age. In this study we concluded that supplementation of Livon can replace synthetic liver tonic as evident by the comparable bird's growth, viability, hypocholesterolemeic effect.

KEYWORDS: Livon, Liver Tonic, Feed Conversion Rate, Cholesterol and Triglyceride.

INTRODUCTION

The health and productivity of poultry largely depends on optimum feed utilization, improved body weight, absence of disease and low mortality.[1] All these parameters are directly related

to optimum liver health. Liver is an important organ actively involved in many metabolic functions and is the frequent target for number of diseases and toxicants.[2] Seasonal changes manifest a risk of disease and liver is the major organ affected. Rapid and maximum growth in a minimum period with efficient feed utilization is of utmost importance for the profitable poultry production, as the feed itself contributes about 70% of the total expenditure on poultry farming. An efficient feed utilization and its conversion to egg & meat is essential. This can be achieved by supplementation of certain growth promoters & liver tonics along with 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.[3,4]

The present investigation was undertaken to study the efficacy of herbal liver tonic product Livon, manufactured by Orbit Bioscience, India on overall growth, performance, feed efficiency and carcass traits in commercial broilers birds. Livon consists of herbs namely *Andrographis paniculata*[5], *Azadirachta indica*[6], *Solanum nigrum, Trachyspermum ammi, Eclipta alba, Nigella sativa, Picrohriza kurroa*[7,8] these herbs by virtue of their therapeutic action, for example, liver cell rejuvenating (hepatogenerative), hepato-stimulative, hepatoprotective, anti-hepatotoxic and positive anabolic effect can tone up the liver of poultry birds for optimum performance and productivity.

MATERIALS AND METHODS

An experimental trial was conducted at the poultry trial farm, Orbit Bioscience, India. The methodology of research trial and protocol was legally approved by the Orbit Bioscience's ethical committee. The vaccinated chicks were randomly divided into three groups with one control (T_0) and two treatments (T_L and T_C) having 20 birds in each group with 3 replicates. Chicks in Group- T_0 were offered basal broiler starter and grower feed (as per NRC requirements) without any additional source Liver tonic, T_L was supplemented with Livon (Manufactured by Orbit Bioscience, India) 1 ml/liter drinking water and T_C with synthetic liver tonic as per recommended dosage on the product. The birds were reared under standard managemental conditions in deep litter system and offered ad-libitum feeding and watering.

Livon is a polyherbal formulation, scientifically well known to liver stimulant. The inclusion of synthetic liver tonic 9 (undisclosed company) and the vegetal source of Livon (Orbit Bioscience) were performed during the whole experimental periods (15 days to 35 days of age).

Physical parameters

The physical parameters evaluated at 21 and 35 days of age were, weight gain, feed intake, feed conversion and viability.

Biochemical analysis

The serum biochemical estimations were carried out in 3 birds sacrificed at scheduled intervals from each group. The blood samples were collected directly from heart into tubes without anticoagulant for separation of serum. The serum samples were maintained at -20^{0}C until analyzed. The individual serum samples were analyzed for cholesterol and triglyceride. The biochemical estimations were done by using Automatic Biochemical Analyzer '3000 revolution' made by Tulip's Diagnostic Pvt. Ltd., Mumbai. The methodology and the set of reagents used in respect of each parameter were as per the recommendations of the manufacturer of the analyzer system.

Statistical analysis

The data recorded was subjected to statistical analysis to quantify the variation between two treatments for various recorded parameters. Analysis of variance (ANOVA)- The data was analyzed using GENSTAT version 32.0. The sources of factors were various treatments. For better interpretation of the significant results, coefficient of variance (CV) and least significant differences (LSD) were calculated. The values of CV and LSD indicate the treatment to be statistically at par or not. t-statistical test was also performed to know better performer between two treatments.

RESULTS AND DISCUSSION

In view of our study, we measured physio-biochemical parameters at the age of 21 and 35 days after continuously providing Livon (Orbit Bioscience, India) and chemically synthetic Liver tonic. All data was analyzed with GENSTATS 32.0.

In this study, we observed mean maximum weight gain with the Livon supplemented group 779.87 and 1887.2 gm respectively after 21 and 35 days followed by supplemented with

chemical liver tonic 740.65 gm and 1689.5 gm respectively, whereas least body weight gain was observed with no supplemented liver tonic group.

The standard error difference, coefficient of variation and least significant difference were 4.75 (21 days) and 17.15 (35 days), 1.20% (21 days) and 2.70% (35 days) at P=0.005 and 12.34 (21 days) and 28.78 (35 days) respectively. Mean body weight gain was recorded to be significantly higher in treatment groups (T_L and T_C) than control from 1st to 35 days of experiment, however, the values were non-significantly different among two treatments from 1st to 21 day **(Table 1)**. At 35 day, the mean body weight gain of T_L group was significantly higher than T_C **(Table 2)** suggesting that the supplementation of Livon lead to comparatively higher body weight gain than the group fed combination of synthetic Liver tonic in basal ration.

The results in the present study are in justification with those reported by Babu *et al.*, Narahari, Prajapati, Samarsinghe and Went and Natsir *et al.*,[9,10,11,12,13] who reported significant improvements in body weight due to supplementation of other herbal feed additives.

The feed conversion ratio for T_L (1.53 and 1.55) was significantly lower than T_C (1.64 and 1.67) and T_0 (1.87 and 1.82) at the age of 21 days and 35 days respectively that might be due to improved feed efficiency due to supplementation of herbal sources in feed. The results are well in confirmation with those reported by Ma *et al.*,[14] and Kumar *et al.*,[15] that supplementation of polyherbal liver tonic to broilers improved performance in terms of feed efficiency and livability.

Least mortality was observed in the birds that were provided by Livon in their diet due to anti-oxidative property of herbs used in Livon. Less mortality was also observed in chemically synthetic provided synthetic liver tonic as compared to control. Results of our study were with the explanation of Castro *et al.*,[16] and Reis *et al.*,[17]

The least mean cholesterol (102.33 mg/dl) was observed in T_L after 21 days whereas 110.43 mg/dl was observed in T_L after 35 days among the treatments and control. Mean cholesterol was recorded to be significantly lower in treatment groups (T_L and T_C) than control from 1st to 35 days of experiment, however, the values were non-significantly different among two treatments from 1st to 21 day **(Table 1)**. The addition of Liver tonic (Livon/synthetic liver

tonic) in the drinking water of poultry birds significantly contributed in reducing cholesterol & regulating the fat metabolism. At 35 day, the mean cholesterol of T_L group was significantly lower than T_C **(Table 2)** suggesting that the supplementation of Livon (herbal product) lead to reduce cholesterol more efficiently than the group fed combination of synthetic liver tonic in basal ration. The results in the present research were similar to that observed by Kulinski *et al*.,[18]

Triglyceride concentration was observed maximum in control as compared to birds that ingested with either herbal or chemically synthesized liver tonic to the diet. From the data, it can be concluded that in chicks of group T_0 fed diet without any supplementation of liver tonic, there was not complete protection to the liver. The results in the present study are in confirmation with those reported by Lombardi *et al*.,[19]

Table 1: Effect of Livon and chemical liver tonic on various parameters of bird at the age of 21 days.

Treatment	Weight gain (gm.)	Feed intake (gm.)	Feed conversion rate	Mortality (%)	Cholesterol (mg/dl)	Triglyceride (mg/dl)
Control (T_0)	635.02	1189.00	1.87	8.5	125.05	140.07
Livon (T_L)	779.87	1190.45	1.53	0.9	102.33	106.25
Chemical Liver tonic(T_C)	740.65	1212.42	1.64	1.40	107.02	112.61
LSD	**12.34**	**45.05**	**0.16**	**2.31**	**5.58**	**5.03**
CV	**1.20**	**2.98**	**2.02**	**40.23**	**1.45**	**2.00**
SE	**4.75**	**11.12**	**0.12**	**0.15**	**1.75**	**1.59**

Table 2 Effect of Livon and chemical liver tonic on various parameters of bird at the age of 35 days.

Treatment	Weight gain (gm.)	Feed intake (gm.)	Feed conversion rate	Mortality (%)	Cholesterol (mg/dl)	Triglyceride (mg/dl)
Control (T_0)	1475.4	2687.5	1.82	9.6	138.24	126.15
Livon (T_L)	1887.2	2928.0	1.55	1.07	110.43	103.19
Chemical Liver tonic(T_C)	1689.5	2815.5	1.67	1.65	118.1	109.42
LSD	**28.78**	**89.60**	**0.50**	**1.50**	**1.51**	**2.12**
CV	**2.70**	**2.20**	**3.140**	**15.36**	**0.53**	**1.30**
SE	**17.15**	**27.20**	**0.022**	**0.43**	**0.45**	**0.71**

CONCLUSION

From the present study we can conclude that supplementation of recommended dosage of Livon (herbal liver tonic), manufactured by Orbit Bioscience, India can replaces synthetic

liver tonic efficiently as evident by the comparable bird's growth, viability, hypocholesterolemeic effect.

REFERENCES

1. Jogi S and Johar KS. Indian J. Anim. Res., 1997; 31(2): 133-35.
2. Meyer SA and Kulkarni AP. Hepatotoxicity. In: Introduction to biochemical toxicology. 3rd Edn. New York: John Wiley and Sons, 2001; 487.
3. Ather, Mujeeb MA. Clinical efficacy and economics of Livfit Vet liquid and premix in commercial broiler chickens. Poultry Punch, 1999; 15(5): 36-39.
4. Bhasker D, Sharma RK, Chauhan SS, Harpal S and Kumar A. Effect of herbal detoxicants and liver stimulant on the performance of broiler chickens. Indian J. of Poult. Sci., 2003; 38(2): 110-114.
5. Handa SS, Sharma A. Hepatoprotective activity of andrographolide from Andrographis paniculata against carbontetrachloride. Indian J Med Res., 1990; 92: 276-83.
6. Chattopadhyay RR, Sarkar SK, Ganguly S, Banerjee RN, Basu TK, Mukherjee A. Hepatoprotective activity of Azadirachta indica leaves on paracetamol induced hepatic damage in rats. Indian J Exp Biol., 1992; 30(8): 738-40.
7. Raju K, Anbuganapathi G, Gokulakrishnan V, Rajkapoor B, Jayakar B, Manian S. Effect of dried fruits of Solanum nigrum LINN against CCl4-induced hepatic damage in rats. Biol Pharm Bull., 2003; 26(11): 1618-9.
8. Subash KR, Ramesh KS, Charian, Binoy Vargheese, Britto Francis, Rao N, Jagan Vijaykumar S. Study of Hepatoprotective Activity of Solanum nigrum and Cichorium intybus. Int J Pharmacol, 2011; 7(4): 504.
9. Babu M, Gajendran K, Sheriff FR, Srinivasan G. Crown Grow fit supplementation in broilers improved their performance. Indian Poult Rev, 1992; 23: 27-28.
10. Narahari D. Performance promoting ability of ' Activity Forte ' in broilers. Poul Adv, 1992; 25(7): 37-38.
11. Prajapati. Effect of dietary supplementation of Livfit vet premix on performance of broilers. Indian J. Poult. Sci., 1997; 32(1): 86-88.
12. Samarasinghe K and Went C. Effect of herbs on performance of broilers. Iin Proc. 11th Eur. Poult. Conf., Bremen, Germany, 2002; 116.
13. Natsir MH, Hartulik O, Sjofjan and Widodo E. Effect of Either Powder or Encapsulated form of Garlic and Phyllanthus niruri L. Mixture on Broiler Performances, Intestinal Characteristics and Intestinal Microflora. Int J Poult Sci, 2013; 12(11): 676-680.

14. Ma D, Shan A, Chen et al. "Effect of Ligustrum lucidum and Schisandra chinensis on the egg production, antioxidant status and immunity of laying hens during heat stress," Arch Anim Nutr, 2005; 59(6): 439–447.
15. Kumar M, Choudhary RS and Vaishnav JK. Effect of supplemental prebiotic, probiotic and Turmeric in diet on the performance of chicks during summer. Int J Poult Sci, 2005; 40: 137-141.
16. Castro SF, Fortes BDA, Carvalho JCC, Bertechini AG, Queiroz LFB, Garcia JR. Relação metionina e colina dietética sobre o desempenho de codornas japonesas (*Coturnix coturnix japonica*) em postura. Ciência Animal Brasileira. 2011; 12(4): 635-641. Português. http://dx.doi.org/10.5216/cab.v12i4.9976
17. Reis SR, Barreto SLB, Paula E, Muniz JCL, Viana GSV and Mencalha R. Níveis de suplememtação de colina na dieta de codornas japonesas em postura. Revista Brasileira de Agropecuária Sustentável, 2012; 2(1): 118-123. Português.
18. Kulinski A., Vance, D.E and Vance, J.E., 2004, A Choline-deficient Diet in Mice Inhibits neither the CDPcholine Pathway for Phosphatidylcholine Synthesis in Hepatocytes nor Apo lipoprotein B Secretion, Journal of Biol. Chem, 279(23): 23916 – 23924.
19. Lombardi B, Pani P and Chlunk, FFS. Choline deficiency fatty liver: impaired release of hepatic triglycerides, Journal of Lipid Research, 1968; 9: 437-446.