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RESEARCH ARTICLE

EFFECT OF SUPPLEMENTATION OF SUPERLIV LIQUID ON THE PERFORMANCE OF COMMERCIAL BROILERS IN SALIMPUR POULTRY FARM OF MATHURA

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Abstract

A field trial was conducted to assess efficacy of liver tonic Superliv liquid supplementation in broilers. 6000 day old chicks (Cobb 400) were divided randomly into two identical groups (n= 3000). The group T_1, control group birds were given standard basal diet and group T_2, treatment group birds were given basal diet supplemented with Superliv liquid at 5ml/100 birds/day from 1-2 week,10 ml/100 birds/day from 2-4 week and 20ml/100 birds/day from 4-6 week. Parameters viz. growth performance, dressing percentage and cost benefit analysis were studied form 0-6 weeks. Statistical analysis of results revealed that Superliv liquid supplementation significantly ($P<0.05$) improved body weight and body weight gain in supplemented birds. Weekly feed intake between the both groups varied non- significantly at 2nd, 3rd and 5th week of study. Over all feed conversion ratio was significantly better ($P<0.05$) in Superliv liquid supplemented birds. Economically better returns were achieved with Superliv liquid supplementation

INTRODUCTION

Feed intake, body weight, hatchability, mortality, carcass characteristics, and other important traits governing the prosperity of the industry (**Sahin et al., 2009**). With poultry farming profits becoming marginal because of the increasing price of feed ingredients, enhancing farm productivity by improving feed utilisation has become a core issue (**Meyer and Kulkarni, 2001**). NRC recommendation are usually based on the needs of healthy birds under ideal condition, but birds in commercial systems are normally exposed to different kinds of stresses, diseases and also the combination of environmental condition (**Maroufyan et al., 2010**). Good feed alone will not serve the purpose but its better utilization is also essential. As feed is the major component of input cost, accounting for up to 70% of the total production cost (**Hassan et al., 2011**) so various phytobiotics viz. prebiotic, probiotic, organic acid, enzymes have been used for better feed utilization in poultry (**Grashorn, 2010**). Liver as an important organ involved in various metabolic pathways regulating growth and productivity in poultry. As liver has a wide range of functions, it is vulnerable to various diseases. Hepatoprotection by conventional and synthetic drugs used in treatment of liver diseases are inadequate and sometimes can have serious side effects (**Guntupalli et al., 2006**). Various phytogenics which improve liver function and improve feed utilization have been used for growth promotion in poultry (**Alloui et al., 2014; Onu, 2010; Hashemi and Davoodi, 2010**). Based upon this a study was designed to explore the efficacy of Superliv liquid, polyherbal liver tonic product in improving performance of commercial broilers. Superliv liquid contain herbs viz. *Andrographis paniculata*, *Azadirachta indica*, *Boerhaavia diffusa*, *Eclipta alba* and many other possessing hepatoprotective, immunomodulatory, immunostimulatory activities **(Devaraj et al., 2010; Yanpallewar et al., 2003; Sharma et al., 1994),** which might improves the body weight, feed utilization and dressing percentage in poultry birds.

MATERIALS AND METHOD

To study the effect of Superliv liquid (M/S Ayurvet Limited, India) on growth and performance in commercial broilers, 6000 day old chicks (Cobb 400) were divided randomly into two identical groups (n= 3000). The group T_1, control group birds were given standard basal diet containing 23% CP and 2800 kcal/kg M.E in starter ration (0d-21d) and 20% CP and 2900 kcal/kg M.E in finisher ration (21d-42d). The group T_2, treatment group birds were given basal diet supplemented with Superliv liquid at 5ml/100 birds/day from 1-2 week, 10 ml/100 birds/day from 2-4 week and 20ml/100 birds/day from 4-6 week. Parameters viz. growth performance (body weight, body weight gain, average feed intake/consumption, and feed conversion ratio), dressing percentage and cost benefit analysis were studied form 0-6 weeks. Feed and water was offered ad libitum throughout the experimental period.

Statistical analysis

All the data obtained were analyzed as per the standard statistical procedure (**Snedecor and Cochran, 1980**). Significant differences among treatment means were calculated as per DMRT test (**Duncan, 1955**).

RESULTS AND DISCUSSION

Body weight (g)

The average weekly change in body weight given in table 1. The average weekly body weight in Superliv liquid supplemented group was found to be significantly (P<0.05) high as compared to control group throughout the experiment.

Table 1: Effect of Superliv liquid on the average weekly body weight (g) of commercial broilers during 0-6 week period

Treatment	Day old	1st week	2nd week	3rd week	4th week	5th week	6th week
Control	42.00	160.00[a]	290.00[a]	540.00[a]	911.67[a]	1405.00[a]	1790.00[a]
Superliv liquid	42.00	210.00[b]	338.33[b]	633.33[b]	1200.00[b]	1601.67[b]	2101.67[b]
Pooled SEM	0.86	11.55	11.58	21.20	64.71	44.11	69.77
Significance level	NS	P<0.001	P<0.05	P<0.001	P<0.001	P<0.001	P<0.001

Means bearing different superscripts within a column differ significantly

After the 1st week of Superliv liquid supplementation significantly (P<0.001) more body weight (g) was recorded in group T_2 birds (210) in comparison of control group T_1 birds (160). On 2nd, 3rd, 4th, 5th and 6th week, in Superliv liquid supplemented group T_2 birds the average body weight (g) was significantly (P<0.001, <0.05) more (338.33, 633.33, 1200, 1601.67, 2101.67, respectively) in comparison to control group T_1 birds (290, 540, 911.67, 1405, 1790, respectively). Results were in accordance with **Babu et al** (1992) and **Natsir et al** (2013), who reported increase in poultry body weight after herbal supplementation.

Body weight gain (g)

The average weekly weight gain was significantly (P<0.05) more in Superliv liquid supplemented group T_2 (168g and 295g) as compared to control group T_1 (118g and 250g) at 1st and 3rd week (table 2).

Table 2: Effect of Superliv liquid on the average weekly weight gain (g) of commercial broilers during 0-6 week period

Treatment	0-1 wk	1-2 wk	2-3 wk	3-4 wk	4-5wk	5-6 wk
Control	118.00[a]	130.00	250.00[a]	371.67[a]	493.33[a]	385.00[a]
Superliv liquid	168.00[b]	128.33	295.00[b]	566.67[b]	401.67[b]	500.00[b]
Pooled SEM	11.75	3.96	11.38	43.69	21.63	26.42
Significance level	P<0.05	NS	P<0.05	P<0.001	P<0.05	P<0.001

Means bearing different superscripts within a column differ significantly (P<0.05)
NS: Non significant (P>0.05)

Again at 4th and 6th week (table 2) the average weekly weight gain was found to be significantly (P<0.001) high in Superliv liquid supplemented group (566.67g and 500g) as compared to control group (371.67g and 385g). The body weight gain in Superliv liquid supplemented birds may be attributed to the growth promoting activity of its constituent herbs viz. *Andrographis paniculata, Azadirachta indica, Phyllanthus niruri* (**Mathivanan et al., 2006; Durrani et al., 2008; Jagadeeswaran and Selvasubramanian, 2014**)

Average Feed Intake (g) and Feed conversion ratio (FCR)

The increased cost and limited supply of conventional vegetable proteins have required contemporary research efforts geared toward the potential utilization of protein from locally available food crops (**Khattab et al.,**

2009). Superliv liquid supplementation improves the feed utilization. The average daily feed intake was found to be significantly (P<0.05) high in Superliv liquid supplemented group T_2 (243g, 930g and 1050g) as compared to control group T_1 (182.33g, 705g and 920g) at 1st, 4th and 6th week of study (table 3). At 2nd, 3rd and 5th week of study, average daily feed intake varied non significantly.

Table 3: Effect of Superliv liquid on the average weekly feed intake (g) of commercial broilers during 0-6 week period

Treatment	**0-1 wk**	**1-2 wk**	**2-3 wk**	**3-4 wk**	**4-5wk**	**5-6 wk**
Control	182.33	280.67	491.67	705.00	845.00	920.00
Superliv liquid	243.00	281.33	499.00	930.00	810.00	1050.00
Pooled SEM	14.81	2.85	4.52	51.62	10.47	33.07
Significance level	P<0.05	NS	NS	P<0.001	NS	P<0.05

Means bearing different superscripts within a column differ significantly
NS: Non significant (P>0.05)

During first three weeks of study the feed efficacy (table 4) was significantly better (P<0.05) in Superliv liquid supplemented group T_2 (1.73) in comparison to unsupplemented control group T_1 (1.92). During next three weeks (4th, 5th, 6th) of the study, the feed efficacy was non-significantly better in Superliv liquid supplemented birds (1.90) in comparison to control group birds (1.98). The improvement in feed efficacy in Superliv liquid supplemented birds was because in comparison of feed consumption the relative gain in body weight was more.

Table 4: Effect of Superliv liquid on the mean FCR from 0-6 weeks

Treatment	**0-3 wk**	**3-6 wk**	**0-6 wk**
Control	1.92^{a}	1.98	1.96^{a}
Superliv liquid	1.73^{b}	1.90	1.85^{b}
Pooled SEM	0.04	0.02	0.03
Significance level	P<0.05	NS	P<0.05

Means bearing different superscripts within a column differ significantly
NS: Non significant (P>0.05)

Superliv liquid constituent herbs viz. Andrographis paniculata, Boerhaavia diffusa, Picrorrhiza kurroa are reported to improve the feed utilization (**Yusuf et al., 2014; Chithambaran and Devid, 2014; Alexander et al., 2008**). Significantly better (P<0.05) overall FCR in the Superliv liquid supplemented group T_2 is due to feed utilization improvement potential of ingredient herbs.

Dressing percentage

Dressing percentage and percentage yield of carcass cuts, dependent upon rearing system, length of fattening period and broiler sex (**Bogosavljevic-Boskovic et al., 2011**). Dressing percentage (%) was calculated by dividing the carcass weight by live body weight. Though, there was no significant difference in the percent dressing yield was recorded in both groups, yet better dressing yield (%) was recorded for Superliv liquid supplemented group T_2 (80.81) in comparison of unsupplemented control group T1 (78.10) (table 5).

Table 5: Effect of Superliv liquid on the percent dressing yield of commercial broilers

Treatment	**Dressing yield (%)**
Control	78.10
Superliv liquid	80.81
Pooled SEM	1.11
Significance level	NS

NS: Non significant (P>0.05)

Cost-benefit analysis

Cost-benefit analysis is a systematic approach to estimating the profitability to poultry farmers and efficacy of product supplementation in terms of net profit over controlled group. The net profit over control group in Superliv liquid supplemented group was Rs. 13.46 (table 6). Cost-benefit ratio CBR in Superliv liquid supplemented group was 26.92:1.

Table 6: Cost benefit analysis of Superliv liquid supplementation

INCOME	**T0 : Control**	**T1: Superliv Liquid**
Avg. Weight /Bird (Kg)	1.790	2.101
Cost of Birds @ Rs 80/kg	Rs. 143.2	Rs. 168.08
INCOME	**Rs. 143.2**	**Rs. 168.08**
INVESTMENT	**T0**	**T1**
Cost of Chick	28	28
Feed consumption /chick	3.42 kg	3.81 kg
Feed cost/bird (@Rs.28/kg)	Rs.95.76	Rs.106.68
Misc Cost (vaccination, water, electricity/chick)	Rs.15	Rs.15
Amount of product supplemented	---	4.9 ml
Cost of Product supplementation (Rs.)	**---**	**0.50**
Total investment/group	**Rs.138.76**	**Rs. 150.18**
Profit = Income - Investment	**Rs.4.44**	**Rs.17.90**
Profit over control	**---**	**Rs. 13.46**
Tentative CBR		**26.92:1**

CONCLUSION

Average weekly body weight and body weight gain were significantly increased in the birds supplemented with Superliv liquid (herbal liver tonic supplement). Improved FCR was found in Superliv liquid supplemented birds. Superliv liquid supplementation gave better economic returns.

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