



**ORIGINAL RESEARCH PAPER**

**Veterinary Science**

**IMPACT OF HERBAL LIVER TONIC HEPARAN-N SUPPLEMENTATION ON GROWTH AND PERFORMANCE IN BROILER CHICKEN**

**KEY WORDS:** Heparan N, feed conversion ratio, live weight gain, Carcass weight

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**ABSTRACT**

Efficient liver function is crucial for metabolism, circulation, detoxification, excretion, defense, and haemopoiesis in animals. This study aimed to evaluate the impact of the polyherbal liver tonic Heparan N (manufactured by M/S Rivansh Animal Nutrition Private Limited, India) on growth and performance in broiler chickens. Sixty day-old chicks were randomly divided into two groups (T0 and T1). Both groups received basal diets (starter and finisher) according to NRC requirements and 12-hour daily artificial lighting. Group T0 served as the control without any liver tonic premix, while group T1 received basal diet supplemented with Heparan N (250 g/tonne of feed from 0-35 days). Statistical analysis indicated a significant ( $P > 0.05$ ) increase in live weight (g) and live weight gain (g) in the T1 group supplemented with Heparan N (1886 and 1842, respectively) compared to the control T0 group (1814 and 1771, respectively). The feed conversion ratio (FCR) and dressing percentage were also significantly improved in the T1 group compared to T0. Plasma concentrations of total protein (g/dl) and enzymes (AST/ALT) (U/L) did not show significant differences ( $P > 0.05$ ) between the groups, although numerically higher values were observed in the Heparan N supplemented group. Overall, the trial demonstrated beneficial effects of Heparan N on growth and performance in broiler chickens without any safety concerns observed during the study.

**INTRODUCTION**

The health and productivity of poultry are intricately linked to factors such as feed efficiency, body weight gain, disease resistance, environmental conditions, and genetic makeup. Optimal feed utilization is particularly crucial in poultry production, where the liver plays a pivotal role in various digestive, metabolic, and productive functions. However, the liver is susceptible to microbial and chemical toxins present in low-quality feed, compromising its functions and leading to reduced health and productivity in birds.

In the poultry industry, the production of substandard feed has contributed to numerous challenges, including poor performance and decreased profitability. Enhancing nutrition represents a significant opportunity for improving livestock productivity, with up to two-thirds of productivity gains in animal production systems attributed to improved feeding practices. Economically, feed costs constitute a substantial portion, accounting for approximately 70% of total livestock production expenses. Optimal utilization of feed resources could potentially increase tropical livestock productivity by up to five-fold.

Achieving rapid and efficient growth within a minimal timeframe is paramount for profitable broiler production. Conventional and synthetic drugs used for hepatoprotection often fall short and may entail serious side effects. In contrast, Ayurvedic medicinal preparations have been traditionally recommended for liver disorders, offering potential benefits such as hepatoprotection and immunomodulation. These preparations are believed to enhance birds' immunity, reduce mortality and morbidity, and improve tolerance against toxins, thereby enhancing overall productivity.

Previous studies have demonstrated favourable outcomes in broiler performance with the inclusion of herbal liver tonics in their diets. Given these considerations, this study investigates the efficacy of Heparan N, a herbal liver tonic supplied by M/S Rivansh Animal Nutrition Private Ltd., Paonta Sahib, on the growth, performance, feed efficiency, and carcass traits of commercial broilers. Heparan N incorporates herbs such as *Emblica Officinalis*, *Andrographis paniculata*, *Azadirachta indica*, and *Solanum nigrum*, known for their therapeutic properties including liver cell rejuvenation, hepatostimulation, hepatoprotection, antihepatotoxic effects, and positive anabolic effects. These actions are expected to

optimize liver function in poultry, thereby promoting enhanced performance and productivity.

**MATERIALS AND METHODS**

The study was carried out at the Department of Animal Husbandry, Berwal Research and Trial Farm in Saharanpur, India.

**Experimental Design**

The objective of this experimental trial was to investigate the effects of the herbal liver tonic Heparan N (manufactured by M/S Rivansh Animal Nutrition Private Limited, India) on the growth and performance of broiler chickens. Sixty day-old chicks were randomly divided into two groups: T<sup>0</sup> (control) and T<sup>1</sup> (experimental), with identical conditions. Both groups received basal diets (starter and finisher) formulated according to standard NRC requirements, supplemented with 12 hours of daily artificial lighting.

Group T<sup>0</sup> was provided with the standard basal diet without any liver tonic premix, while group T<sup>1</sup> received the basal diet supplemented with Heparan N (250 g/tonne of feed) from 0 to 35 days of age. All chicks were vaccinated according to routine farm practices. Individual body weights were recorded at the start of the trial (0 days), and additional parameters such as average feed intake, feed conversion ratio, mortality rates, and incidence of fatty liver syndrome were monitored weekly throughout the experimental period (at 7, 14, 21, 28, and 35 days of age).

Serum biochemical parameters were assessed at the end of the 3rd and 5th weeks of the study using representative samples from each group (4 birds per replicate). Statistical analysis of the results was performed using analysis of variance (ANOVA) to determine means and standard errors, following the methods described by Snedecor and Cochran.

**RESULT AND DISCUSSION**

Statistical analysis of the results showed a significant ( $P < 0.05$ ) increase in live weight (LW) and live weight gain (LWG) at the 5th week of age. The herbal liver tonic Heparan N supplemented group T<sup>1</sup> exhibited higher LW (1886 g) and LWG (1842 g) compared to the control group T<sup>0</sup>, which recorded LW of 1814 g and LWG of 1771 g (Table 1 and Table 2). These findings align with previous studies which also

reported significant improvements in body weight following supplementation with various herbal feed additives.

**Table-1: Weekly body weight (g) of broiler.**

Weeks	T <sup>0</sup> group	T <sup>1</sup> Group
1 <sup>wk.</sup>	167	166
2 <sup>wk.</sup>	453	456
3 <sup>wk.</sup>	889	886
4 <sup>wk.</sup>	1428	1408
5 <sup>wk.</sup>	1814	1886

**Table-2: Body Weight Gain (G) of Broiler.**

Weeks	T <sup>0</sup> group	T <sup>1</sup> Group
1 <sup>wk.</sup>	124	123
2 <sup>wk.</sup>	411	412
3 <sup>wk.</sup>	846	847
4 <sup>wk.</sup>	1386	1393
5 <sup>wk.</sup>	1771	1842

**Feed Conversion Ratio**

At the conclusion of the experiment, the group supplemented with the herbal liver tonic Heparan N (T1 group, FCR = 1.78) exhibited improved Feed Conversion Ratio (FCR) compared to the untreated control group (T0 group, FCR = 1.86), although this difference was not statistically significant (P > 0.05) (see Table 3). This finding aligns with previous research by Ma et al., who similarly observed enhanced FCR in laying hens fed a diet supplemented with herbs such as *Ligustrum lucidum* and *Schisandra chinensis*

**Table-3: Feed Conversion Ratio of Broiler Chicken.**

Weeks	T <sup>0</sup> group	T <sup>1</sup> Group
1 <sup>wk.</sup>	0.99	0.99
2 <sup>wk.</sup>	1.26	1.19
3 <sup>wk.</sup>	1.45	1.42
4 <sup>wk.</sup>	1.60	1.56
5 <sup>wk.</sup>	1.86	1.78

The results also corroborate with findings from Kumar et al., who observed a significant improvement in feed efficiency when broilers were supplemented with turmeric in their diet.

**Carcass Characteristics**

Dressing percentage (see Table 4) was significantly improved (P < 0.05) in the Heparan N supplemented group (T<sup>1</sup>: 71) compared to the untreated group (T<sup>0</sup>: 68). The proportion of carcass weight also showed a significant increase in the Heparan N supplemented group. This finding aligns with previous studies by Sharma et al. and Elagib et al., who similarly reported increased dressing yield under dietary interventions.

**Table 4: Carcass Characteristics of Broiler Chicken.**

Parameters	T <sup>0</sup> group	T <sup>1</sup> group
Dressing %	68	71
Giblet %	5.1 <sup>a</sup>	6.5 %
Neck %	6.2 <sup>a</sup>	7.5 <sup>a</sup>
Wing %	11.6 <sup>a</sup>	13.5
Back %	20.6 <sup>a</sup>	25.5
Breast %	30.4 <sup>a</sup>	37.9 <sup>o</sup>
Thigh %	16.1 <sup>a</sup>	21.9
Drumstick %	11.4	13.3

Mean within the rows bearing different superscript are significantly different (P<0.05)

**Plasma Protein and Enzyme Concentration**

The plasma concentrations of total protein (g/dl), AST (IU/L), and ALT (IU/L) did not show significant differences between both groups on both day 21 and day 35 (see Table 5), with P-values greater than 0.05.

**Table 5: Plasma Protein and Enzyme Concentration of Broiler Chicken.**

Parameters	Total protein, g/dl		AST, IU/L		ALT, IU/L	
	21	35	21	35	21	35
Age, day	21	35	21	35	21	35
T <sup>0</sup> group	3.5	3.9	121	146	18.0	16.1
T <sup>1</sup> group	3.5	4.2	128	150	18.3	17.5

The study examined the effects of Heparan N supplementation in broiler chickens, focusing on the activities of AST (aspartate aminotransferase) and ALT (alanine aminotransferase) enzymes. Results showed that AST levels were 128 IU/L on day 21 and increased to 150 IU/L by day 35, while ALT levels were 18.3 IU/L on day 21 and slightly decreased to 17.5 IU/L by day 35 in the supplemented group. However, these changes were found to be non-significantly higher (P < 0.05) compared to the control group. These findings align with previous research in broiler chickens, which also reported no significant differences in the activities of AST, ALT, and LDH (lactate dehydrogenase) enzymes following supplementation with herbs. This suggests that while there were some variations in enzyme levels with Heparan N supplementation, they did not reach statistical significance compared to the control, consistent with earlier studies in similar contexts.

**CONCLUSION**

Based on the comprehensive findings from the study, it can be concluded that supplementation with the liver tonic product Heparan N is effective in enhancing growth, performance, and carcass traits in broiler chickens, while also normalizing biochemical parameters. The study indicates that Heparan N is safe for use and can be recommended as a liver tonic and growth enhancer in poultry farming. These results highlight its potential benefits in improving overall poultry health and productivity, supporting its practical application in poultry management strategies. Further research and validation in varied conditions would strengthen these conclusions and explore its full potential in poultry nutrition and health management.

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Certainly! Here's a reorganized version of the references in a different order:

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