

## Effect of Supplementation of *Moringa oleifera* Leaves Powder on Blood Serum Profile of Giriraja Poultry Birds

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(Received 28 April 2022, Accepted 20 June, 2022)

(Published by Research Trend, Website: [www.researchtrend.net](http://www.researchtrend.net))

**ABSTRACT:** The current work “Supplementation of *Moringa oleifera* Leaves Powder on Blood Serum Profile of Giriraja Poultry” is being done in the Poultry Unit, Department of Poultry Science, PGIVAS, MAFSU and under the Department A.H. & D.S., Dr. P.D.K.V., Akola to check the effect of the addition of *Moringa* leaves a powder on the blood profile of Giriraja Chicken Birds. In the present study 240 number day chicks are divided into eight triple treatments, each of which has ten birds. The treatments were (T<sub>1</sub>) control with no supplementation, (T<sub>2</sub>) standard ration plus 0.4% MOLP, (T<sub>3</sub>) standard ration plus 0.6% MOLP, (T<sub>4</sub>) standard ration plus 0.8% MOLP, (T<sub>5</sub>) standard ration plus scavenging, (T<sub>6</sub>) standard ration plus 0.4% MOLP with scavenging, (T<sub>7</sub>) standard ration plus 0.6% MOLP with scavenging, (T<sub>8</sub>) standard ration plus 0.8% MOLP with scavenging. Data from Giriraja chicken blood serum profile showed that the highest levels of total protein T<sub>6</sub> (4.61), albumin T<sub>6</sub> (1.72), glucose T<sub>6</sub> (128.01), Cholesterol T<sub>1</sub> (146.00), Triglyceride T<sub>1</sub> (83.61), respectively.

**Keywords:** Giriraja, *Moringa oleifera* leaves powder.

### INTRODUCTION

Poultry is one of the most widely consumed animal species in developed and developing countries, where the WHO recommends a dietary diet of 60 gm/animal per person per day. Poultry production has been practiced in many developing countries for many generations as an important source of nutrition and sustainable income. Egg and poultry production has always been highly regarded as it has been increasing by 8 to 10% per annum compared to 1.5% to 2% crop production per year. The Indian poultry industry has made tremendous progress, with poultry farming playing a major role in the lives of many rural families, especially rural women. The type of feed is an important factor affecting the return of the net from the poultry business.

Gyenis *et al.* (2006) observed a decrease in cholesterol levels in colored birds in the post-rearing system. It depicts different images of blood and the immune system as they are developed with a combination of concentrations in different systems, depending on the specific needs of the modern lifestyle and the needs of the individual. With simple interventions such as adding concentrate mixture to local birds can greatly improve the survival, growth and production of poultry (Sarkar and Bell 2006). Recalling this study was therefore designed to study the impact of various

augmentation programs on food chemistry, haematological parameters and the insecurity status of the Vanaraja birds.

Increasing popularity of the use of *Moringa oleifera* as a poultry supplement requires research into its nutritional value, and its impact on haematological parameters as a measure of both the nutritional and therapeutic benefits of the leaves in poultry (Ebenebe *et al.*, 2012). *Moringa oleifera* leaves combined with poultry feed have led to better growth of chicks and a significant increase in serum levels of organic minerals compared to maize feed alone (Donkor *et al.*, 2013).

*Moringa oleifera* is one of the best ways to feed as it is widely known as Moringa seeds and leaves that are widely used in the food industry and in medicine. There are about 13 species of Moringa trees in the family Moringaceae and they are all native to India. The leaves are nutritious and contain a large amount of vitamins (A, B and C), calcium, iron, copper, sulphur and protein. Moringa leaves have a high protein content ranging from 25% to 32%.

### MATERIAL AND METHODS

Experiments were conducted at the poultry unit of the Post Graduate Institute (PGI), VAS, MAFSU, Akola, Maharashtra between 2017-18 and 2018-19 using 240 chicks, Giriraja chicks, which were obtained from Government hatchery, Nagpur, Maharashtra. These

birds came from the same area and were bred in the same way. Upon arrival, the chicks are weighed

separately and randomly divided into eight treatments with three repetitions, each with ten birds.

**Table 1: The details of dietary treatments and levels of compositions.**

Sr. No.	Particulars	MOLP levels	System of management
T <sub>1</sub>	Std. Ration	Control	
T <sub>2</sub>	Std. Ration	0.4%	
T <sub>3</sub>	Std. Ration	0.6%	
T <sub>4</sub>	Std. Ration	0.8%	
T <sub>5</sub>	Std. Ration	Control	Scavenging
T <sub>6</sub>	Std. Ration	0.4%	Scavenging
T <sub>7</sub>	Std. Ration	0.6%	Scavenging
T <sub>8</sub>	Std. Ration	0.8%	Scavenging

Where, Std. Standard, MOLP- *Moringa oleifera* Leaves Powder Blood samples were randomly collected from birds at the end of the experiment, one bird per stamp was randomly selected and blood samples were collected for biochemical serum analysis. Blood samples are collected at the end of the 8th week of life in the vein with a single bird injection in each recurrence. The blood collected in a sterile test tube is stored in a sloping position and the serum is separated. All serum samples are stored at a depth of ice at 20°C until they are processed.

All serum samples were analyzed in the Department of Veterinary Biochemistry, PGI, VAS, MAFSU, Akola.

## RESULT AND DISCUSSION

### A. Serum biochemical Parameter

A moderate amount of serum component such as total protein, albumin, glucose, cholesterol and triglycerides of Giriraja birds influenced by the inclusion of *Moringa oleifera* leaves in the leaf and distribution, estimated by the end of the test and presented in Table 3 and is clearly represented in Fig.1.

**Table 2: Effect of Moringa leaves powder on hematological parameters of Giriraja poultry birds with or without scavenging.**

Treatments	Hb (mg/dl)	PCV (%)	RBC (X10 <sup>6</sup> / L)	WBC (X10 <sup>3</sup> / mm <sup>3</sup> )
1	2	3	4	5
T <sub>1</sub>	9.60	29.05	2.81	12.22
T <sub>2</sub>	9.92	29.90	3.24	13.90
T <sub>3</sub>	10.01	30.45	3.17	13.27
T <sub>4</sub>	10.25	30.77	3.10	13.37
T <sub>5</sub>	10.26	30.82	3.31	13.67
T <sub>6</sub>	10.38	30.91	3.39	13.87
T <sub>7</sub>	10.31	30.84	3.30	13.82
T <sub>8</sub>	10.29	30.77	3.28	13.61
<b>Mean</b>	10.12	30.43	3.20	13.46
<b>SE ±(m)</b>	0.016	0.021	0.014	0.024
<b>CD at 5%</b>	0.058	0.069	0.050	0.078
<b>Significance</b>	Sig	Sig	Sig	Sig

The results show a serum lipid profile of Giriraja domesticated birds at various levels of *Moringa oleifera* leaves powder and scavenging. In the present study total protein was recorded at 4.00, 4.12, 4.27, 4.11, 4.08, 4.61, 4.31 and 4.24 mg/dl in the treatment of T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub>, T<sub>6</sub>, T<sub>7</sub>, and T<sub>8</sub> respectively. There, its dosage was found at 4.21 mg/dl. 0.4% infusion of *Moringa oleifera* leaves powder has the highest level followed by 0.6% of *Moringa oleifera* leaves powder and scavenging and the lowest level of total protein found in T<sub>1</sub> i.e. control.

In the present study albumin was recorded at 1.41, 1.42, 1.54, 1.50, 1.49, 1.72, 1.62 and 1.51 in the treatment of T<sub>1</sub> to T<sub>8</sub>, respectively. There, a dose of mean 1.52mg/dl was found. Albumin was found to be very high in 0.4% of *Moringa oleifera* powder by excreting followed by 0.6% of *Moringa oleifera* powder with scavenging and the low amount found in T<sub>1</sub> i.e. control. The albumin value has clearly shown that all *Moringa oleifera*

supplements leave the powder and waste treatment at a much higher rate than other treatment groups.

In the present study glucose was recorded at 124.00, 125.48, 124.18, 124.64, 124.89, 128.01, 127.28 and 125.89 in the treatment of T<sub>1</sub> to T<sub>8</sub>, respectively. There, its dosage was found at 125.67 mg / dl. Also, the result showed that glucose uptake increases as *Moringa oleifera* intake leaves powder and purification increases in food, the glucose difference in 0.4% of *Moringa oleifera* powdered leaf extraction per extract was very high (p <0.05) higher compared and others treatment groups.

In the present study cholesterol was recorded at 146.00, 141.89, 138.63, 136.81, 137.08, 136.00, 138.41 and 137.61 in the treatment of T<sub>1</sub> to T<sub>8</sub>, respectively. There, its dosage was found at 139.17 mg/dl. The level of difference in cholesterol T<sub>1</sub> to T<sub>8</sub> was not significant. Individual cholesterol decreased by 0.4% in *Moringa oleifera* infusion powder and scavenging.

Demonstration of cholesterol decrease in 0.4% *Moringa oleifera* leaves powder by crushing followed by 0.6% *Moringa oleifera* leaves powder and scavenging.

In the present study triglycerides were obtained 83.61, 82.79, 82.61, 82.44, 80.59, 77.01, 78.08 and 79.10 for T<sub>1</sub> to T<sub>8</sub> treatment, respectively. There, its dose was 79.90 mg / dl. Triglyceride was found to be very low in

T<sub>1</sub> i.e. 0.4% *Moringa oleifera* infusion powder diluted followed by 0.6% *Moringa oleifera* leaves powder in defiance and the highest amount found in T<sub>1</sub> i.e. control group other than *Moringa oleifera* powder leaves have a significantly lower (p <0.01) higher serum triglyceride levels than in any other treatment group.

**Table 3: Effect of Moringa leaves powder on serum biochemical parameters of Giriraja poultry birds with or without scavenging.**

Treatments	Total Protein (mg /dl)	Albumin (mg/dl)	Glucose (mg/dl)	Cholesterol (mg/dl)	Triglycerides (mg/dl)
T <sub>1</sub>	4.00	1.41	124.00	146.00	83.61
T <sub>2</sub>	4.12	1.42	125.48	141.89	82.79
T <sub>3</sub>	4.27	1.54	124.18	138.63	82.61
T <sub>4</sub>	4.11	1.50	124.64	136.81	82.44
T <sub>5</sub>	4.08	1.49	124.89	137.08	80.59
T <sub>6</sub>	4.61	1.72	128.01	136.00	77.01
T <sub>7</sub>	4.31	1.62	127.28	138.41	78.08
T <sub>8</sub>	4.24	1.51	125.89	137.61	79.10
Mean	4.21	1.52	125.67	139.17	79.90
SE ±(m)	0.048	0.026	0.049	0.404	0.031
CD at 5%	0.152	0.089	0.155	1.223	0.103
Significance	Sig	Sig	Sig	Sig	Sig

Outcome agreement with Balami *et al.* (2018) who reported that HDL-cholesterol, cholesterol level and triglyceride decreased significantly at 42 days of age. The results of the current study can be linked to the result of Akinola *et al.* (2018) who reported that MOLM causes better cholesterol. The result showed that a maximum of 0.5%, 1.0% of MOLM, triglyceride and low density lipoprotein had no effect on high density lipoprotein cholesterol. This selective reduction results in the improvement of the ratio of HDL-cholesterol to LDL-cholesterol. Similar findings with Bolu *et al.* (2013) reported that LDL-cholesterol decreased as the 5% daily intake of *Moringa oleifera* leaf increased.

Other findings contradicting this study showed that, MOLM support for broiler chicken diet did not significantly affect the lipid profile of broiler chickens, reported by Zanu *et al.* (2012); Gakuya *et al.* (2014). Current results also disagree with Aderinola *et al.* (2013) who reported that the serum parameter was slightly affected without triglycerides and cholesterol decreased significantly as the intake rate increased.

## CONCLUSIONS

The present study concluded that the highest total total protein T<sub>6</sub> (4.61), albumin T<sub>6</sub> (1.72), glucose T<sub>6</sub> (128.01) were found in 0.4% of MOLP in the diet without a decrease in Cholesterol T<sub>6</sub> (136.00) and Triglyceride T<sub>6</sub> (77.01)), respectively.

## REFERENCES

Aderinola O.A., T.A. Rafiu, A.O. Akinwumi, T.A. Alabi and O.A. Adeagbo (2013) Utilization of *Moringa oleifera* leaf as feed supplement in broiler diet. *Int. J. of Food, Agri and Vet. Sci.*, 3(3), 94-102.

Akinola L.A.F. and Ovotu N. (2018). Influence of *Moringa oleifera* leaf meal on egg lipids and blood constituents of laying hens. *J. of Experimental Agric. Int.*, 22(2) ISSN: 2457-0591.

Balami A. G., Abdu P. A., Wakawa A. M., Aluwong T., Oladele S. B., Enam S. J. (2018). Humoral immune response of broilers fed with *Moringa oleifera* supplemented feed and vaccinated with an inactivated infectious bursal disease vaccine. *African J. of Biomedical Res.*, 21, 57-60.

Bolu, S. A., Suleiman, F. F., & Adeyemi, K. D. (2013). Effects of *Moringa oleifera* leaf meal on the performance, haematology and serum biochemistry of broiler chickens. *Niugini Agrisaiens* (5), 1(9).

Donkor R. L., K. Glover, D. Addae and K.A Kubi (2013) Estimating the nutritional value of the leaves of *Moringa oleifera* on poultry. *Food and Nutrition Sciences*, 4, 1077-1083.

Ebenebe, C.L, Co. Umegechi, Aniebo and BO Nweze (2012). Comparison of haematological parameters and weight changes of broiler chicks fed different level of *Moringa oleifera* diet. *Inter. J. Agric. Bio. Sci.* 1(1), 23-25.

Gakuya, D.W., Mbugua, P. N., Kavoi, B. and Kiama, S. G. (2014). Effect of supplementation of *Moringa oleifera* leaf meal in broiler chicken feed. *Int. J. Poult. Sci.*, 13(4), 208-213.

Gyenis, J., Suto, Z., Romvari, R. and Horn, P. (2006). Tracking the development of serum biochemical parameters in two laying hen strains: a comparative study. *Archieve Tierzlander*, 49, 593-606.

Sarkar, K. and Bell, J. G. (2006). Potentialities of the indigenous chicken and its role in poverty alleviation and nutrition security for rural households. *Int. network for family poultry development newsletter*, 16(2), 15-26.

Zanu, H.K., Asiedu, P., Tampuori, M., Abada M. and Asante, I. (2012). Possibilities of using moringa (*Moringa oleifera*) leaf meal as a partial

substitute for fishmeal in broiler chickens diets. *J of Animal and Feed Res.*, 2(1), 70-75.

**How to cite this article:** K.D. Rathod, S.D. Chavan, R.R. Shelke, S.R. Shegokar, K.U. Bidwe, S.J. Manwar, S.R. Munnarwar, R. D. Dhage, S.P. Nage, P.A. Kahate (2022). Effect of Supplementation of *Moringa oleifera* Leaves Powder on Blood Serum Profile of Giriraja Poultry Birds. *Biological Forum – An International Journal*, 14(2): 1591-1594.