

EFFECT OF SUPPLEMENTATION OF *MORINGA OLIEFERA* LEAF MEAL AND *TINOSPORA CORDIFOLIA* POWDER ON PERFORMANCE OF BROILER CHICKEN

S.B. NAGARGOJE, S.M. BHALERAJO*, A.V. KHANVILKAR, A.S. KADAM, G.S. SONAWANE, A.K. BARATE, JAVED ASHAR and B.C. ANDHALE

Department of Animal Nutrition, Krantisingh Nana Patil College of Veterinary Science, MAFSU, Shirwal-412801, Dist. Satara (Maharashtra)

Received: 13.06.2022; Accepted: 20.08.2022

SUMMARY

An experiment was carried out on 240, day-old broiler chicks for a period of six weeks. The experimental birds were randomly distributed into four treatment groups with four replications of each treatment; having fifteen birds replicate each. The maize-soya based ration was formulated as per BIS (2007) for control treatment (T_0). The treatment group (T_1) was offered the *Moringa oleifera* leaf meal (MOLM) at 0.5% and *T. cordifolia* powder (TCP) at 0.5% of in diet. The treatment group (T_2) was given the *M. oleifera* leaf meal (MOLM) at 0.75% and *T. cordifolia* powder (TCP) at 0.75% of in diet. The treatment group (T_3) received the *M. oleifera* leaf meal (MOLM) at 1.0% and *T. cordifolia* powder (TCP) at 1.0% of in diet. The supplementation of *M. oleifera* leaf meal and *T. cordifolia* powder gives significantly higher ($P < 0.05$) overall body weights, body weight gain, feed intake while significantly lower ($P < 0.05$) FCR compared to control group.

Keywords: Broiler birds, *Moringa oleifera*, *Tinospora cordifolia*, Body weight and FCR

How to cite: Nagargoje, S.B., Bhalerao, S.M., Khanvilkar, A.V., Kadam, A.S., Sonawane, G.S., Barate, A.K., Ashar, J. and Andhale, B.C. (2023). Effect of supplementation of *Moringa oleifera* leaf meal and *Tinospora cordifolia* powder on performance of broiler chicken. *The Haryana Veterinarian* 62(1): 155-157.

Poultry serves as a vital tool to provide nutritional security and supplementary income. As indiscriminate use of antibiotics in poultry industry is reported to be rising, use of herbal and plant derivatives may prove to be a potential alternative for promoting poultry output (Safamehr *et al.*, 2012). Herbals with their low toxicity to the host system, sufficient absorption, and capacity to reach the target organ without being degraded by host enzymes, with their immunomodulatory activity have been used (Arivuchelvan *et al.*, 2012). *Moringa oleifera* leaves are high in lipids, proteins, vitamins, minerals and have antibacterial properties (Onunkwo and George 2015). Furthermore, due to the presence of phytochemicals in their leaves, that helps to prevent the production of reactive oxygen species (ROS) and free radicals (Ogbunugafor *et al.*, 2011). *Tinospora cordifolia* entire plant has a wide range of health benefits and has long been used as a traditional medicine to treat a variety of human problems (Bhattacharyya and Bhattacharyya, 2013).

The presence of arabinogalactan in *Tinospora cordifolia* leaves has been shown to have immunomodulatory, antimicrobial, antioxidant, hepatoprotective, anti-stress activities (Sinha *et al.*, 2004). In this context, this study was conducted to explore the beneficial aspects of these materials in broiler production.

MATERIALS AND METHODS

An experiment was carried out on 240, day-old broiler chicks for a period of six weeks. The experimental

chicks were divided randomly into four treatment groups having four replicates of fifteen birds each. All the standard managerial practices like fumigation, cleaning, etc. before arrival of chicks, housing, feeding, watering, vaccination were followed strictly. The chicks were reared in deep litter system. The maize soya based ration was formulated as per BIS (2007) for broiler chicks as pre-starter, starter and finisher ration for control treatment (T_0). The treatment group (T_1) was offered the *Moringa oleifera* leaf meal (MOLM) at 0.5% and *Tinospora cordifolia* powder (TCP) at 0.5% of in the diet. The treatment group (T_2) was given the *Moringa oleifera* leaf meal (MOLM) at 0.75% and *Tinospora cordifolia* powder (TCP) at 0.75% of in the diet. The treatment group (T_3) was received the *Moringa oleifera* leaf meal (MOLM) at 1.0% and *Tinospora cordifolia* powder (TCP) at 1.0% of in the diet. By using an electric weighing machine the birds were weighed on 0th day and at the end of each week. The weekly gain in live body weight was calculated based on 0th day and weekly live body weights from all the experimental birds. The daily feed intake of birds was recorded as per group. Weekly feed consumption and feed conversion ratio (FCR) was calculated to determine unit quantity of feed required to gain unit live body weight under different treatment groups. The feedstuffs were analyzed as per AOAC (2005). The data obtained was analysed as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The details of performance of broiler birds

*Corresponding author: sanjaybhaleraoann@gmail.com

Table 1. Performance of Broiler Birds Supplemented with *Moringa oliefera* leaf meal and *Tinospora cordifolia* Powder

AGE	T ₀	T ₁	T ₂	T ₃	CV	P-Value
Weekly live body weight (g)						
Day- old	47.14±0.47	48.06±0.27	48.09±0.60	48.46±0.30	1.94	0.234
1 st week	219.18±4.47	216.64±1.35	209.48±6.80	204.09±5.73	3.96	0.24
6 th week	2536.53±15.50 ^b	2658.30±24.35 ^a	2722.65±45.27 ^a	2697.17±23.19 ^a	3.40	0.003
Weekly feed intake (g)						
1 st week	179.34±1.47	186.32±2.23	184.29±1.29	183.90±2.09	2.28	0.98
6 th week	1013.31±20.33	1003.18±56.98	1049.34±29.13	1011.41±25.22	6.54	0.80
Overall	4083.17±50.51 ^b	4059.52±46.71 ^b	4287.42±44.33 ^a	4175.24±68.33 ^{ab}	3.20	0.04
Weekly gain in live body weight (g)						
1 st week	172.03±4.12 ^a	168.58±1.36 ^{ab}	160.63±3.08 ^{bc}	155.63±2.79 ^c	5.21	0.00
6 th week	472.08±14.47	504.75±39.70	502.25±9.76	494.34±13.59	8.67	0.73
Overall	2439.62±63.20 ^b	2607.86±22.13 ^a	2674.80±45.89 ^a	2650.03±21.39 ^a	4.66	0.00
Weekly feed conversion ratio (g)						
1 st week	1.02±0.03 ^b	1.10±0.01 ^{ab}	1.14±0.02 ^a	1.17±0.03 ^a	6.90	0.01
6 th week	2.12±0.04	1.99±0.07	2.08±0.04	2.03±0.03	5.06	0.32
Overall	1.67±0.05	1.55±0.01	1.60±0.01	1.57±0.01	4.47	0.06

Note: a, b, c, ab bearing different superscripts in a row differ significantly (P<0.05).

supplemented with *Moringa oliefera* leaf meal and *Tinospora cordifolia* powder is presented in table 1. The body weight of broiler birds in groups T₀, T₁, T₂ and T₃ at the end of the first week were non-significant. The average BW of broilers in groups T₀, T₁, T₂ and T₃ did not showed a significant difference in the first, third and fourth weeks. The average body weight at the end of the sixth week was significantly higher (P<0.05) in broilers of a group T₂, T₃, T₁ and lower in the control group T₀. The results of present study are in accordance with the results of Agashe *et al.* (2017) and Priya *et al.* (2020) who observed significantly higher weekly body weight in treatment groups supplemented with *Moringa oliefera* leaf meal and *Tinospora cordifolia* compared to control group.

At the end of the first week, second week, third week, fourth week, fifth week the average feed intake of broilers representing groups (T₀), (T₁), (T₂) and (T₃) were observed non-significant. Cumulative feed intake was significantly higher in broilers of a group (T₂), (T₃) and lower in control group (T₀). During the entire experimental period of six weeks, no significant difference in average feed intake was observed but the average cumulative feed intake of broiler showed a significant difference (P<0.05). Similar results were recorded by Cui *et al.* (2018), Tazi, (2014) and David *et al.* (2012) who conducted an experiment on *Moringa*-based feed additives on the growth performance of broilers and found significant differences in feed intake of broilers. At the end of the first

week, the average body weight gain of broilers representing (T₀), (T₁), (T₂) and (T₃) were noticed as significant while non-significant in second week, third week, fourth week, fifth week and sixth week but cumulative body weight gain significantly higher in broilers of a group (T₂), (T₃), (T₁) and lower in the control group (T₀). Similar results were observed by Onu *et al.* (2011) and Singh *et al.* (2018) who studied the influence of *Moringa oleifera* leaf meal on the growth performance broiler birds. At the end of first week, the FCR of broilers representing groups (T₀), (T₁), (T₂), and (T₃) were noticed as significant. FCR of broilers in groups (T₀), (T₁), (T₂) and (T₃). At the end of the third week, fourth week, fifth week and sixth week FCR of broilers for groups (T₀), (T₁), (T₂) and (T₃) did not differ significantly. The overall FCR of broiler did not differ significantly. Similar results were recorded by Banjo *et al.* (2012), Singh *et al.* (2014) and Hassan *et al.* (2016).

CONCLUSION

The results of present study indicate that, the supplementation of *Moringa oleifera* leaf meal and *Tinospora cordifolia* powder improves overall body weight, body weight gain and feed intake lowered feed conversion ratio compared to the un-supplemented group.

REFERENCES

- Agashe, J.L., Manwar, S.J., Khose, K.K. and Wade, M.R. 2017. Effect of supplementation of *Moringa oleifera* leaf powder on growth performance of broilers. *J. Poult. Sci. Technol.* **5**(3): 28-34.
- A.O.A.C. (2005). Official Method of Analysis. (17th Edn.), Volume 1.

Association of Official Analytical Chemists, Collegiate Press, Washington, DC, USA. **16**: 1-173.

- Arivuchelvan, A., Murugesan, S., Mekala, P. and Yogeswari, R. (2012). Immunomodulatory effect of *Ocimum sanctum* in broilers treated with high doses of gentamicin. *Indian J. Drugs and Diseases*. **1(5)**: 109-112.
- Banjo, O.S. (2012). Growth and performance as affected by inclusion of *Moringa oleifera* leaf meal in broiler chicks diet. *Growth. J. Biology, Agriculture and Healthcare*. **2(9)**: 35-38.
- Bhattacharyya, C. and Bhattacharyya, G. (2013). Therapeutic potential of Giloe, *Tinospora cordifolia* (Willd.) Hook. f. and Thomson (Menispermaceae): The magical herb of ayurveda. *Int. J. Pharm. Biol. Arch*. **4**: 558-584.
- B.I.S. (2007). Bureau of Indian Standards, Poultry Feeds. Specification (Fifth Revision). IS: 1374-2007, Manak Bhavan, 9, Bahadurshah Zafar Marg, New Delhi-11 110002, pp. 3-4.
- Cui, Y.M., Wang, J., Lu, W., Zhang, H.J., Wu, S.G. and Qi, G.H. (2018). Effect of dietary supplementation with *Moringa oleifera* leaf on performance, meat quality, and oxidative stability of meat in broilers. *Poult. Sci*. **97(8)**: 2836-2844.
- David, L.S., Vidanarachchi, J.K., Samarasinghe, K., Cyril, H.W. and Dematawewa, C.M.B. (2012). Effects of Moringa-based feed additives on the growth performance and carcass quality of broiler chicken. *Trop. Agril. Res*. **24(1)**: 12-20.
- Hassan, H.M.A., El-Moniary, M.M., Hamouda, Y., El-Daly, E.F., Youssef, A.W. and Abd El-Azeem, N.A. (2016). Effect of different levels of *Moringa oleifera* leaves meal on productive performance, carcass characteristics and some blood parameters of broiler chicks reared under heat stress conditions. *Asian J. Anim. and Vet. Advances*. **11(1)**: 60-66.
- Ogbunugafor, H.A., Eneh, F.U., Ozumba, A.N., Igwo-Ezikpe, M.N., Okpuzor, J., Igwilo, I.O. and Onyekwelu, O.A. (2011). Physico-chemical and antioxidant properties of *Moringa oleifera* seed oil. *Pakistan J. Nutr*. **10(5)**: 409-414.
- Onu, P.N. and Aniebo, A.O. (2011). Influence of *Moringa oleifera* leaf meal on the performance and blood chemistry of starter broilers. *Intl. J. Food, Agri. and Vet. Sci*. **1(1)**: 38-44.
- Onunkwo, D.N. and George, O.S. (2015). Effects of *Moringa oleifera* leaf meal on the growth performance and carcass characteristics of broiler birds. *IOSR J. Agri. and Vet. Sci*. **8(3)**: 63-66.
- Priya, K., Rajadurai, A. and Sundaram, S.M. (2020). The effect of *Tinospora cordifolia* (Seenthil chooranam) in broiler chicken. *J. Entomol. Zool. Studies*. **8(2)**: 780-783.
- Safamehr, A., Mirahmadi, M. and Nobakht, A. (2012). Effect of nettle (*Urtica dioica*) medicinal plant on growth performance, immune responses, and serum biochemical parameters of broiler chickens. *Intl. Res. J. Appl. and Basic Sci*. **3(4)**: 721-728.
- Singh, A., Kaushik, P.K., Yadav, P.K. and Yadav, P. (2014). Effect of Bael (*Aeglemarmelos*) and Giloy (*Tinospora cordifolia*) alone and in combination on growth and feed conversion of broiler chicks. *Global J. Res. Anal*. **3**: 96-99.
- Singh, S., Maan, N.S., Rana, V., Jyotsana, J., Tewatia, B.S. and Sheoran, N. (2018). Effect of dietary inclusion of Giloy (*Tinospora cordifolia*) stem powder on growth performance and metabolizability in broilers. *J. Entomol. Zool. Studies*. **6(5)**: 36-40.
- Sinha, K., Mishra, N.P., Singh, J. and Khanuja, S.P.S. (2004). *Tinospora cordifolia* (Guduchi), a reservoir plant for therapeutic applications: A review. *Indian J. Traditional Knowledge*. **3(3)**: 257-270.
- Snedecor, G.W. and Cochran, W.G. (1994). Statistical Methods. Iowa State University Press, Ames, Iowa. **196**: 254-268.
- Tazi, S.M. (2014). Effect of feeding different levels of *Moringa Oleifera* leaf meal on the performance and carcass quality of broiler chicks. *Internl. J. Sci. and Res*. **3(5)**: 147.

CONTRIBUTORS MAY NOTE

- | Research/Clinical articles are invited for next issue from the Scientists/Veterinarians engaged in Veterinary Profession.
- | Please follow strictly the format of 'The Haryana Veterinarian' for manuscript writing/ submission.
- | Please pay processing fee of Rs. 1000/- online in the account of Dean, College of Veterinary Sciences, along with each article.
- | After revision, please return the revised manuscript and rebuttal at the earliest.
- | Please mention your article reference number in all correspondence for a quick response.
- | We solicit your co-operation.
- | All correspondence should be addressed to 'The Editor', Haryana Veterinarian, Department of Veterinary Parasitology, College of Veterinary Sciences, LUVAS, Hisar-125004.

Editors