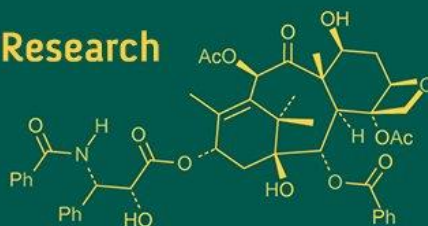


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Effect of moringa (*Moringa oleifera*) leaves powder supplementation on growth performance of Sonali poultry birds

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Abstract

The present investigation was conducted to evaluate the effect of dietary supplementation of *Moringa oleifera* leaves powder on growth performance of Sonali poultry birds. A total of 120 day-old Sonali chicks were randomly distributed into four treatment groups, with 30 birds in each treatment and three replications of 10 birds each. The dietary treatments were T₁: basal diet, T₂: basal diet + 0.2% Moringa leaves powder, T₃: basal diet + 0.4% Moringa leaves powder and T₄: basal diet + 0.6% Moringa leaves powder. The experimental trial was conducted for eight weeks. Feed consumption, water consumption, feed conversion ratio, live body weight, weekly body weight gain and cumulative body weight gain were recorded. Treatment T₂ recorded the highest final live body weight (960.50 g/bird) and cumulative body weight gain (924.13 g/bird), whereas T₁ recorded the lowest values. The overall feed conversion ratio was also better in T₂ (2.16) compared with T₁ (2.32), T₃ (2.20) and T₄ (2.23). The findings indicated that supplementation of Moringa leaves powder, particularly at 0.2% level, improved feed utilization and growth performance of Sonali poultry birds.

Keywords: *Moringa oleifera*, Sonali poultry, feed intake, water intake, FCR, live body weight, body weight gain

1. Introduction

Poultry production is an important source of animal protein and livelihood, while feed cost remains one of the major expenses in poultry production. Therefore, improving growth performance is essential for profitable poultry production. Moringa (*Moringa oleifera*) is a nutritionally rich plant containing protein, minerals, vitamins and various bioactive compounds. Moringa leaves powder has therefore attracted attention as a natural feed supplement for improving poultry performance and nutrient utilization. Several studies have reported beneficial effects of Moringa supplementation on feed intake, feed conversion and growth performance; however, the response may vary with breed, inclusion level and management conditions. Hence, the present investigation was undertaken to evaluate the effect of different levels of Moringa leaves powder supplementation on growth performance of Sonali poultry birds.

2. Materials and Methods

2.1 Experimental birds and design

The experiment was conducted at the Department of Animal Husbandry and Dairy Science, College of Agriculture, Nagpur. A total of 120 day-old Sonali poultry chicks were used for the experiment. The birds were randomly allotted to four dietary treatments under a completely randomized design. Each treatment consisted of 30 birds distributed into three groups consisting of 10 birds each. The experimental feeding period was eight weeks.

2.2 Dietary treatments

The experimental treatments were T₁: Basal diet without Moringa leaves powder, T₂: Basal diet + 0.2% Moringa leaves powder, T₃: Basal diet + 0.4% Moringa leaves powder and T₄: Basal diet + 0.6% Moringa leaves powder.

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The different inclusion levels of Moringa leaves powder were selected to assess their effect on feed utilization and growth performance of Sonali poultry birds.

3. Results and Discussion

3.1 Growth performance

3.1.1 Live body weight

Live body weight increased progressively from day-old age to the eighth week in all treatment groups. The initial body weights were 35.49, 36.37, 35.86 and 35.35 g/bird in T₁, T₂, T₃ and T₄, respectively. The treatment groups were statistically comparable at the beginning of the experiment. From the above table weight were observed among treatments during the experimental period. T₂ consistently maintained the highest live body weight from the early

growth stages and recorded the highest body weight of 960.50 g/bird at the eighth week. T₃ and T₄ recorded 935.21 and 915.86 g/bird, respectively, whereas T₁ recorded the lowest final body weight of 865.41 g/bird. The higher body weight observed in T₂ suggests that 0.2% Moringa leaves powder was more effective than the other tested inclusion levels under the conditions of the present study. The improvement may be associated with the nutritional constituents and bioactive compounds of Moringa leaves, which may support nutrient utilization and growth. The present findings agreed with Agashe *et al.* (2017) [1], Khan *et al.* (2017) [4], Sarker *et al.* (2017) [14], Kumar *et al.* (2018) [5], Murali *et al.* (2020) [11], Meel and Sharma (2021) [8] and Madavi *et al.* (2021) [7], who reported improved body weight following Moringa supplementation.

Table 1: Average weekly live body weight of Sonali poultry birds (g/bird)

Treatment	Average weekly live body weight(g/bird)								
	Initial wt.	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
T ₁	35.49	89.09	160.52	239.3	349.61	478.85	619.77	730.82	865.41
T ₂	36.37	91.82	164.64	247.47	360.57	497.83	645.15	779.61	960.50
T ₃	35.86	91.18	163.94	246.34	359.11	494.16	639.51	758.92	935.21
T ₄	35.35	89.41	161.56	240.83	351.91	480.02	624.17	743.00	915.86
Mean	35.76	90.37	162.66	243.49	355.3	487.72	632.15	753.08	919.24
SE(m)±	0.21	0.26	0.21	0.18	0.21	0.47	0.25	0.40	0.46
CD at 5%	0.70	0.86	0.69	0.61	0.69	1.54	0.84	1.31	1.51
'F' Test	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig

3.1.2 Weekly body weight gain

Weekly body weight gain increased with advancement of age, although the magnitude of gain varied among treatments. During the first week, to the eighth week

significant differences were observed in the experiment. At the eighth week, T₂ recorded the highest weekly body weight gain (180.89 g/bird), followed by T₃ (176.29 g), T₄ (172.86 g) and T₁ (134.59 g).

Table 2: Average weekly body weight gain (g) per bird

Treatment	Average weekly body weight gain (g/bird)							
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
T ₁	53.6	71.43	78.77	110.31	129.24	140.75	111.04	134.59
T ₂	55.45	72.82	82.83	113.09	137.26	147.32	134.45	180.89
T ₃	55.31	72.76	82.4	112.76	135.05	145.35	119.41	176.29
T ₄	54.05	72.15	79.27	111.07	128.11	144.15	118.82	172.86
Mean	54.6	72.29	81.10	111.81	132.41	144.43	120.93	166.15
SE(m)±	0.27	0.29	0.3	0.17	0.58	0.42	0.41	0.38
CD at 5%	0.88	0.97	1.00	0.55	1.91	1.38	1.35	1.25
'F' Test	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig

The consistently higher body weight gain in T₂ corresponded with its higher final live body weight. This indicates that supplementation with Moringa leaves powder at 0.2% supported better growth throughout the experimental period. The findings are in agreement with Agashe *et al.* (2017) [1], Khan *et al.* (2017) [4], Khalid *et al.*

(2021) [3] and Madavi *et al.* (2021) [7], who reported improved body weight gain following Moringa supplementation.

3.2 Feed consumption

Table 3: Average weekly feed consumption of Sonali poultry birds (g/bird)

Treatment	Average weekly feed consumption (g/bird)								Treatment mean
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	
T ₁	75.71	130.75	190.24	242.23	267.47	305.21	340.72	380.60	241.61
T ₂	78.28	133.75	193.08	245.91	274.16	311.09	357.51	411.05	250.60
T ₃	77.21	132.17	192.11	244.83	271.74	309.3	351.23	405.92	248.06
T ₄	76.54	130.75	190.59	243.18	270.25	308.37	350.61	401.08	246.42
Mean	76.93	131.85	191.50	244.04	270.90	308.49	350.01	399.66	
SE(m)±	0.25	0.38	0.29	0.31	0.43	0.45	0.36	0.47	
CD at 5%	0.84	1.24	0.95	1.01	1.42	1.47	1.19	1.54	
'F' Test	Sig	Sig	Sig	Sig	Sig	Sig	Sig	Sig	

The overall feed consumption during the experimental period was highest in T₂, followed by T₃, T₄ and T₁. The higher feed consumption in T₂ may be associated with improved feed acceptability and increased nutrient requirements corresponding to the greater growth rate of birds. The progressive increase in feed consumption with age was common to all treatments and reflected the increasing nutrient requirement of growing birds. The present findings are in agreement with Kumar *et al.* (2018)^[5], who observed higher feed intake in *Moringa*-supplemented Vanaraja birds. Madavi *et al.* (2021)^[7] also reported improved feed intake following supplementation with drumstick leaf powder. Nantapo *et al.* (2024)^[12] reported that *Moringa* supplementation improved feed efficiency and overall growth performance. However, responses to *Moringa* supplementation may vary depending upon inclusion level, bird breed, age, form of *Moringa* supplementation, basal diet and environmental conditions.

3.3 Feed conversion ratio

Feed conversion ratio is an important indicator of feed utilization efficiency. A lower FCR indicates better conversion of feed into body weight gain.

The treatment means for weekly FCR were 2.32, 2.16, 2.20 and 2.23 for T₁, T₂, T₃ and T₄, respectively. Thus, T₂ recorded the lowest and consequently the best overall FCR. The improved FCR in T₂ indicates more efficient utilization of feed for body weight gain. The beneficial effect may be associated with the nutritional and bioactive components of *Moringa* leaves, which may support nutrient utilization and digestive efficiency. The findings are in agreement with Agashe *et al.* (2017)^[1], Alshukri *et al.* (2018)^[2], Latif *et al.* (2019)^[6], Madavi *et al.* (2021)^[7] and Meel and Sharma (2021)^[8], who reported improved feed conversion efficiency at suitable *Moringa* inclusion levels.

4. Conclusion

Based on the results of the present investigation, dietary supplementation of *Moringa oleifera* leaves powder positively influenced growth performance of Sonali poultry birds. Among the tested treatments, T₂ containing 0.2% *Moringa oleifera* leaves powder was found to be the most effective treatment. It recorded the highest live body weight, body weight gain and feed consumption with the lowest and therefore best feed conversion ratio.

At eight weeks of age, T₂ recorded 960.50 g/bird live body weight, 924.13 g/bird cumulative body weight gain, 2004.85 g/bird cumulative feed consumption and an overall FCR of 2.16. Therefore, under the conditions of the present experiment, supplementation of *Moringa oleifera* leaves powder at 0.2% of the diet may be considered beneficial for improving feed utilization and growth performance of Sonali poultry birds.

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