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Effect of supplementation of *Aloe vera* (*Aloe barbadensis*) powder on growth performance in Kaveri poultry birds

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Abstract

An experiment was conducted at Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur during 2023-2024. The 120 one-day-old Kaveri chicks, were randomly distributed in 4 treatments with 3 replication. The Control group (T₁) was without *Aloe vera* powder, while chicks in treatment group T₂, T₃ and T₄ were fed basal diet with *Aloe vera* powder at 0.5%, 1.0% and 1.5% respectively. The experiment lasted for six weeks. The results of this study indicated that the average feed consumption (g/bird) at the end of 6th week was recorded as 561.70, 567.58, 568.74, 572.98 g in T₁, T₂, T₃ and T₄ respectively. The significantly higher feed consumption was recorded in T₄ group. The average body weight (g/bird) at the end of 6th week of age were, 739.35, 770.11, 790.60, 803.08 g in T₁, T₂, T₃ and T₄ respectively. The significant difference in weekly body weight was found from second week onward. The average weekly body weight gain higher observed in T₄ than other treatment groups.

Keywords: *Aloe vera* powder, feed consumption, body weight, body weight gain

1. Introduction

Poultry is one of the fastest growing segments of the agricultural sector in India. India today is the one of the world's largest producer of eggs and broiler meat. India has 6th rank in world for poultry population. Currently, the total poultry population in our country is 851.81 million (20th Livestock Census) and egg production is around 138.39 billion during 2022-23. The per capita availability during 2022-23 is around 101 eggs per annum (Annual report 2023-24). *Aloe vera* is one of the oldest known medicinal plants gifted by nature, *Aloe vera* often called miracle plant. Feed supplement added to the diet should be used to maximize its positive effects on health, development, and performance with the goal of stabilizing digestion and enhancing feed efficiency. Numerous studies suggest that many benefits of *Aloe vera* are attributable to polysaccharides contained in *Aloe vera*, which compose a large part of dry matter in this gel (Hamman, 2008) [4]. Keeping in view the above facts on the positive effects of *Aloe vera* in poultry birds, present work entitled 'Effect of supplementation of *Aloe vera* (*Aloe barbadensis*) powder on growth performance of Kaveri poultry birds' was observe its effect on performance in term of feed consumption, body weight and body weight gain.

Materials and Methods

During the present investigation, experiments were carried out on "Effect of supplementation of *Aloe vera* (*Aloe barbadensis*) powder on growth performance of Kaveri poultry birds". Materials used and methods adopted are described in this chapter. The present investigation was carried out during 2023-24 at Animal Husbandry and Dairy Science Section, College of Agriculture, Nagpur.

Birds and Diets

In the present study, 120-day-old chicks of Kaveri Poultry Bird were procured from Dhanraj poultry farm, Dhantoli, Nagpur. For the experiment, commercial pre starter, starter and finisher feed were used as basal diet.

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Aloe vera powder was purchased at the Shivshankar Ayurvedic shop, Sitabuldi Market, Nagpur. After purchasing

Aloe vera powder was mixed in commercial poultry feed as per various treatment levels.

Table 1: Details of Dietary Treatments and Feeding

Sr. No.	Treatment groups		Total no. of chicks in each group
1	Basal diet without <i>Aloe vera</i> powder	T ₁	30
2	Basal diet + 0.5% <i>Aloe vera</i> powder.	T ₂	30
3	Basal diet + 1.0 % <i>Aloe vera</i> powder.	T ₃	30
4	Basal diet + 1.5% of <i>Aloe vera</i> powder.	T ₄	30
	Total Chicks		120

Housing and Management

Before the chicks arrived, the brooder house was carefully cleaned using the appropriate disinfectant and fumigants, formaldehyde and KMnO₄ at a 2:1 ratio. The experimental birds reared on deep litter system in well ventilated shed from 0-6 weeks. Paddy husk and saw dust was used as litter material. The vaccinated against Ranikhet and IBD disease.

Observations Recorded

Feed Consumption

The average feed intake in grams/birds/week and the feed consumption of each group as recorded weekly were computed by dividing the total amount of feed by the number of chicks in that specific group. Additionally, the total amount of feed consumed during the trial was noted.

Body Weight

For every treatment group, the average weekly body weight was determined by measuring each chick's weight on the first day and every week at intervals using a digital weighing balance.

Body Weight gain

Body weight gain of chicks at different weeks was obtained by subtracting the body weight of chicks of previous weeks.

Statistical analysis

Data was tabulated and statistical analysed by CRD given by Panse and Sukhatme, 1985^[9].

Results and Discussion

Feed Consumption

In present study, average feed consumption at first week of age for T₁, T₂, T₃, T₄ were 65.04, 63.58, 63.90, 64.93 g/bird respectively. The average feed consumption at 6th week of age for T₁, T₂, T₃ and T₄ were 561.70, 567.58, 568.74 and 572.98 g/bird respectively. The higher feed consumption was observed in treatment T₄, T₃, T₂ and T₁. The significant difference in weekly feed consumption was found from second week onward. The trend of significantly total feed consumption was recorded in T₄ (2128.06), T₃ (2121.19), T₂ (2110.02) and T₁ (2093.19) groups during first to six week.

It can be concluded that the supplementations of *Aloe vera* powder have beneficial effect on growth performance and increase the feed consumption.

Table 2: Average weekly Feed Consumption (g) per bird

Treatment	Average weekly Feed Consumption g/bird						Total
	1 st	2 nd	3 rd	4 th	5 th	6 th	
T ₁	65.04	149.08	284.45	499.22	533.70	561.70	2093.19
T ₂	63.58	148.02	286.39	503.58	540.87	567.58	2110.02
T ₃	63.90	143.05	286.59	507.35	551.56	568.74	2121.19
T ₄	64.93	140.38	290.35	506.04	553.38	572.98	2128.06
Mean	64.36	145.13	286.95	504.05	544.88	567.75	-
'F' test	Sig.						-
SE(m)±	0.28	0.54	0.64	0.56	0.56	0.86	-
CD at 5%	0.91	1.75	2.09	1.82	1.82	2.80	-

These findings were in agreements with the observations of Khan *et al.* (2014)^[6], Nalge *et al.* (2017)^[8] who reported significant effect in increasing average feed intake by experimental birds fed *Aloe vera* in their diet than the birds which were fed on basal diet. On the contrary, Yadav *et al.* (2015)^[11]; Zayed *et al.* (2020)^[12] recorded no significant difference in feed consumption among birds fed *Aloe vera* and the birds fed control diet.

Body Weight

The average weekly growth performance of experimental birds at body weight of Kaveri poultry birds from day old to sixth weeks of age in all dietary treatments were subjected to CRD and the results presented in Table 3.

It was observed from the present study that the average live weight of Kaveri poultry birds at day old stage were 36.88, 38.02, 37.98, 38.07 g for the treatment T₁, T₂, T₃, T₄ respectively. The initial body weights of Kaveri poultry birds was statistically non-significant in all dietary treatments indicating the treatment groups were homogenous in nature.

The average weekly live weights of kaveri birds under the treatments T₁, T₂, T₃, and T₄ weights were 88.50, 88.08, 89.10, and 89.60 g respectively in first week. The average live weight of the birds at the end of 6th week was 739.35, 770.11, 790.60 and 803.08 g in T₁, T₂, T₃ and T₄ respectively. The highest live weight was obtained in treatment T₄ followed by treatments T₃, T₂ and T₁, significant difference was observed in all treatment groups.

Table 3: Average weekly Live Body Weight (g) per bird

Treatment	Average weekly Live body weight (g) per bird						
	Initial wt.	1 st	2 nd	3 rd	4 th	5 th	6 th
T ₁	36.88	88.50	140.60	259.87	453.70	622.94	739.35
T ₂	38.02	88.08	142.40	263.39	479.01	651.87	770.11
T ₃	37.98	89.10	146.80	269.10	484.82	671.56	790.60
T ₄	38.07	89.60	150.70	274.35	490.38	680.38	803.08
Mean	37.74	88.82	145.13	266.68	476.98	656.69	775.76
'F' Test	NS	NS	Sig.				
SE(m)±	0.33	0.55	0.65	0.64	0.54	0.59	1.02
CD at 5%	-	-	2.11	2.1	1.76	1.93	3.32

This findings similar to the result obtained by Gohel *et al.* (2019), who observed that higher body weight and weight gain were significantly higher in birds supplemented with either Tulsi or *Aloe vera* leaves powder or both as compared to control group. Zayed *et al.* (2020) ^[12] recorded significantly higher body weight of birds given *Aloe vera* than the birds fed basal diet. On the contrary, Jamir *et al.* (2019) ^[5] and Riswanda *et al.* (2021) ^[10] regarding incorporation of *Aloe vera* powder in standard broiler diet can be compared with present findings who reported that no significant difference in body weight was observed in experimental birds given *Aloe vera* powder.

Body Weight gain

The data on the average weekly gain in body weight of Kaveri poultry birds from first to six weeks in different treatment was analyzed, tabulated and results was presented in Table 4. It was observed from 4th week that the average gains in live weight were 193.83, 215.62, 215.72 and 216.03 g in T₁, T₂, T₃ and T₄ treatment, respectively. From statistical analysis it was observed that average gain in body weight in treatment T₄ group was (p<0.05%) increased over the treatments. The highest gain of weight observed in treatment T₄ than the control group.

The average weekly gain in body weight at 6th weeks of age of Kaveri birds was 116.31, 118.24, 119.04 g and 122.70 g per bird in treatments T₁, T₂, T₃ and T₄ respectively.

This findings similar to the result obtained by Nakita Bhargande *et al.* (2022) ^[7], who recorded the average body weight gain at the end of 8th week of age were 160.28, 162.49, 168.22 and 185.74 g in T₀, T₁, T₂ and T₃ groups respectively. However, at the end of the eight week, significantly higher body weight gain in the T₃ treatment group. Darabighane *et al.* (2011) ^[2] found significant difference in body weight gain in broiler birds with supplementation of *Aloe vera*. Whereas, Jamir *et al.* (2019) ^[5] reported the statistically no significant difference in weight gain was observed irrespective of treatment groups.

Table 4: 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
T ₁	51.62	52.10	119.27	193.83	169.24	116.31
T ₂	50.06	54.32	120.99	215.62	172.86	118.24
T ₃	51.12	57.70	122.30	215.72	186.74	119.04
T ₄	51.53	61.10	123.65	216.03	190.00	122.70
Mean	51.08	56.30	121.55	210.30	179.71	119.07
'F' test	Sig.					
SE(m)±	0.02	0.06	0.55	0.58	0.56	0.65
CD at 5%	0.06	0.20	1.79	1.91	1.83	2.13

Conclusion

From the results it can be concluded that, the inclusion of 1.5 per cent of *Aloe vera* powder in Kaveri Poultry bird as a feed supplementation was beneficial in improving the Feed consumption, Body weight and Body weight gain.

Conflict of Interest

Not available

Financial Support

Not available

Reference

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