



P-ISSN: 2349-8528

E-ISSN: 2321-4902

www.chemijournal.com

IJCS 2021; 9(1): 1037-1040

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Received: 01-10-2020

Accepted: 05-11-2020

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Studies on feeding of Azolla meal on feed consumption performance of Kadaknath poultry

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DOI: <https://doi.org/10.22271/chemi.2021.v9.i1o.11360>

Abstract

The present investigation entitled “Studies on feeding of Azolla meal on feed consumption performance of Kadaknath poultry” was carried out to assess the effect of Azolla meal on Feed consumption and Feed Conversion Ratio (FCR) of Kadaknath poultry bird’s production. 192, Chicks of day old straight run commercial Kadaknath breed were procured from Government hatchery, Nagpur (Maharashtra). They were randomly and equally distributed into four treatment groups T1, T2, T3 and T4 with 48 numbers of chicks in each group. Azolla meal was added in experimental ration at different levels. The dietary treatments consisted of one basal control (T1), supplemented with 2.5% Azolla meal (T2), 5% Azolla meal (T3) and 7.5% Azolla meal (T4). The average weekly feed consumption of treatment mean T1, T2, T3 and T4 were 252.17, 256.95, 267.29 and 282.61 gm respectively. The average cumulative feed consumption at eighth weeks of age was recorded as 2017.41, 2055.64, 2138.33 and 2260.92 gm for T1, T2 T3 and T4 treatment groups respectively. The average weekly feed efficiency at eighth week of age were 3.98, 3.63, 3.28 and 3.11 in T1, T2, T3 and T4 treatment groups, respectively. The result therefore concludes that supplementation of 7.5 per cent dried Azolla meal was beneficial to improve feed efficiency of birds.

Keywords: Azolla meal, feed consumption, feed conversion efficiency (FCR), Kadaknath poultry

Introduction

Poultry farming amongst Indian livestock vocations occupies a special position because of enormous potential of bringing rapid economic growth incurring low investment. It is one of the most money-spinning businesses of agriculture that bestows nutritious meat and eggs for human consumption within the shortest duration of time. The sustained availability of low-priced, high-quality feeds in India is critical if poultry production is to remain competitive and to continue to grow to meet the increasing consumer demand for eggs and meat (Ali 2007) [2]. Feed alone incurs about seventy per cent of total cost of poultry production. Thus, it required special attention towards lowering feed cost, which reduces input cost to make it economically viable and money spinning for both skilled and unskilled labour. Presently nineteen poultry breeds are registered at the national level. Out of these breeds, one well known native breed is “Kadaknath” meaning a fowl having black flesh. The bird is native of Jhabua and Dhar districts in western parts of Madhya Pradesh. As per available literature Kadaknath lays around 80-90 (Rahangdale *et al.* 2017) [10] eggs annually and the bird is not a good brooder. Ability to adapt in local climatic conditions, breed specific criteria, meat qualities and disease resistant are the factors responsible for the popularity of Kadaknath bird (Thakur *et al.* 2006) [13]. Rao and Thomas (1984) [9] reported the Kadaknath breed contains a high percentage of protein and believed to have aphrodisiac properties. Azolla is a floating fern and belongs to the family Azollaceae (De Frank 1995) [4]. Whereas the use of Azolla meal as feed supplement results in optimum condition for normal growth by acting in various ways. Azolla is very rich in proteins, essential amino acids, vitamins, growth promoter intermediaries and minerals (Kamalasanana *et al.* 2002) [5]. It was observed that the poultry fed on Azolla show significant increase in the body weights and consequently has resulted in an increase in the net return. Considering these, present investigation was planned to find out the “Studies on feeding of Azolla meal on growth performance of Kadaknath poultry”.

Materials and Methods

The present experiment was conducted at Animal Husbandry and Dairy Science Section,

College of Agriculture, Nagpur (MS). The study was conducted for a period of 8 weeks to study the efficiency of utilization of Azolla as feed consumption and feed conversion ratio. Were 192 chicks of day-old age, belongs to Kadaknath breed were individually weighed and randomly divided into four groups of 48 chicks each having almost similar average body weight. Four dietary groups designated as T1, T2, T3 and T4 were formulated by incorporating 0, 2.5, 5 and 7.5 per cent level of dried Azolla, respectively. The vaccination programmed of experimental birds was schedule weekly. All the experimental chicks were reared on deep litter system of rearing with use of rice husk as a litter material. Proper brooding of chicks was done by providing sufficient heat and light by using electric bulbs in each group for first three weeks of age. Afterwards, sufficient artificial light was provided during night hours throughout the experimental period. The experimental chicks were weighted individually at weekly interval up to the eight weeks using electric balance. The feed consumption of each group as recorded weekly and average feed intake in gram/birds/week was calculated by dividing the total amount of feed by the number of chicks in particular group. Cumulative feed consumption for experimental period was also recorded. Feed conversion ratio (FCR) was calculated by dividing the cumulative feed intake by body weight gain of chicks for every week.

Azolla meal production: Azolla was cultivated, multiplied and harvested in concrete tank constructed structure. After maturation of Azolla was harvested, collected and dried for three days until they become crispy while retaining their greenish coloration. The dried leaves were then milled in grinder machine to produce leaf meal, which was then stored in air tight sacs until used for feeding.

Statistical Analysis: Data was tabulated and analyzed keeping in view that objectives of study. Simple, tabular techniques and appropriate statistical method (Panse and Sukhatme, 1985)^[8] was used to ascertain the objectives of the study.

Results and Discussion

The feed supplement like Azolla meal were tried in present study with an objective to study the effect of supplementation of these dried Azolla on feed consumption and feed conversion ratio during the period of experiment data obtained was analyzed statistically and presented and discussed in the light of finding of earlier researches.

Effect of Azolla meal on average weekly feed consumption of Kadaknath poultry birds: The feed consumption of experimental chicks was recorded at weekly interval

throughout the experimental period. The average weekly feed consumption of Kadaknath chicks was recorded, analyzed, tabulated and presented in (Table 1). The pattern of feed intake at first week of age for T1, T2, T3 and T4 were 72.93, 72.91, 72.96 and 72.90 gm/bird respectively. The average feed consumption of treatment mean T1, T2, T3 and T4 were 252.17, 256.95, 267.29 and 282.61 gm respectively. The higher feed consumption was observed in treatments T4, T3, T2 and T1. The significant difference in weekly feed consumption was found from second week onward. The trend of significantly feed consumption treatment mean was recorded in T4 (282.61), T3 (267.29), T2 (256.95) and T1 (252.17) groups during second to eighth week. It can be concluded that the supplementations of Azolla meal have beneficial effect on growth performance and increase the feed consumption.

Effect of Azolla meal on average weekly cumulative feed consumption of Kadaknath poultry birds: The data recorded on average cumulative feed consumption per bird from first to eight weeks in different treatment was analyzed, tabulated and presented in (Table 2). In the present study there was significant increase in cumulative feed consumption at eighth weeks of age were 2017.41, 2055.64, 2138.33 and 2260.92 g in T1, T2, T3 and T4 treatments respectively. The cumulative feed consumption of Kadaknath poultry birds for the treatment groups T4 was higher as compared to T3, T2 and T1 group. The significant difference in cumulative weekly feed consumption was found from second week onward.

Results recorded by some research worker as discussed below are in agreement with present results. Mohammad Jawad Tawasoli *et al.* (2018)^[7] analyzed the cumulative feed consumption at seventh week of age were 2612.80, 2653.04, 2723.10, 2440.50, 2653.80 g in T1, T2, T3, T4 and T5 treatments, respectively. The cumulative feed consumption of Vanaraj poultry birds for the treatment groups T4 was lesser as compared to rest of groups. The significant cumulative feed consumption was recorded in T1 (2612.8), T2 (2653.04), T3 (2723.10), T4 (2440.50) and T5 (2653.80) groups during second to seventh week. Also Rawat N. *et al.* (2015)^[11] observed that dried Azolla when supplemented @ 5% in commercial feed of vencobb broiler chicken improves the cumulative feed intake, resulting in higher gain in body weight and feed conversion efficiency. As well as Mangesh Kumar *et al.* (2018)^[6] concluded that Azolla pinnata up to 7.5 per cent level can be incorporated in broiler ration without any adverse effect on performance of broiler chicks to coup with scarcity of nutrients availability and to have profitable to poultry farming.

Table 1: Average weekly feed consumption of Kadaknath birds

Treatment	Average weekly feed consumption gm/bird								Treatment Mean
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	
T1	72.93	83.33	149.24	225.81	289.25	346.75	402.78	447.32	252.17
T2	72.91	87.32	153.61	230.46	299.32	354.22	419.55	438.25	256.95
T3	72.96	96.12	165.45	242.28	311.15	372.25	441.46	436.66	267.29
T4	72.90	101.34	188.49	255.32	324.56	394.36	462.33	461.62	282.61
Week Mean	72.92	92.02	164.19	238.46	306.07	366.89	431.53	445.96	
'F' test	NS	Sig.							
SE(m)±	0.01	4.09	8.79	6.60	7.61	10.60	12.96	5.72	
CD	.....	12.60	27.08	20.33	23.44	32.66	39.93	17.62	

Table 2: Average cumulative feed consumption of Kadaknath Birds (g/bird)

Treatment	Weeks								Treatment Mean
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	
T1	72.93	156.26	305.50	531.31	820.56	1167.31	1570.09	2017.41	830.17
T2	72.91	160.23	313.84	544.30	843.62	1197.84	1617.39	2055.64	850.72
T3	72.96	169.08	334.53	576.81	887.96	1260.21	1701.67	2138.33	892.69
T4	72.90	174.24	362.73	618.05	942.61	1336.97	1799.30	2260.92	945.96
Week Mean	72.92	164.95	329.15	563.11	873.68	1240.58	1672.11	2118.07	
'F' test	NS	Significant							
SE (m)±	0.01	4.09	12.75	19.34	26.9	37.5	50.38	53.89	
CD	.....	12.60	39.28	59.58	82.88	115.54	155.23	166.04	

Table 3: Weekly feed efficiency of Kadaknath birds

Treatment	Average weekly feed conversion ratio								Treatment Mean
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	
T1	2.43	2.59	2.74	2.40	2.67	2.92	3.20	3.98	2.86
T2	2.49	2.31	2.69	2.37	2.65	2.87	3.16	3.63	2.77
T3	2.47	2.28	2.60	2.38	2.62	2.83	3.10	3.28	2.69
T4	2.43	2.33	2.65	2.36	2.58	2.81	2.99	3.11	2.65
Week Mean	2.45	2.37	2.67	2.37	2.63	2.85	3.11	3.50	
'F' test	NS	Sig.							
SE (m)±	0.01	0.07	0.02	0.08	0.01	0.02	0.04	0.19	
CD	.....	0.215	0.061	0.246	0.030	0.061	0.123	0.58	

Effect of Azolla meal on average weekly overall feed efficiency of Kadaknath poultry birds

The data recorded on average weekly feed conversion ratio was calculated, tabulated and presented in the (Table 3). The average weekly feed efficiency at eighth week age were 3.98, 3.63, 3.28 and 3.11 in T1, T2, T3 and T4 treatments groups, respectively. The FCR was found to be statistically significant for 2nd, 4th, 5th, 6th, 7th and 8th weeks. The better cumulative FCR observed during 4th week of age in T4 (2.31). It is showing the positive effects of supplementation of Azolla meal as feed additives in poultry diet.

Results recorded by research worker as discussed below are in agreement with present results. Basak *et al.* (2002) [3] Observed significant difference in feed conversion ratio among the broilers feed with 0, 5, 10 and 15 per cent Azolla meal during 5-6 weeks and 2-6 week periods. Poor feed conversion ratio was obtained in treatment group which received 15 per cent Azolla (2.5) that was similar to the treatment group which received 10 per cent Azolla (2.38). Alalade and Iyayi (2006) [1] reported that the feed efficiency improved from 3.13 on control diet to 2.54 in birds fed 10 per cent Azolla meal and to 2.55 on 15 per cent Azolla meals in diet. As well as similar result studied by Sharma (2014) [12] evaluated the substitution of unconventional fern i.e. Azolla at 5 per cent in the feed of broiler birds exhibited significantly ($P < 0.05$) higher level body weight and improved FCR without affecting the palatability of the feed substitution at 2, 3 and 4 per cent did not affect the palatability and exhibited biological performance similar to birds reared on conventional feed. Azolla has the potential as an unconventional feed ingredient to be included in the poultry ration at 5 per cent level for economizing the cost of production thus giving more return to the farms.

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