



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(8): 36-39
© 2023 TPI
www.thepharmajournal.com
Received: 18-05-2023
Accepted: 21-06-2023

Keshram Meena
Department of Animal
Production, RCA, MPUAT,
Udaipur, Rajasthan, India

Lokesh Gupta
Department of Animal
Production, RCA, MPUAT,
Udaipur, Rajasthan, India

Bhavya Pal
Department of Animal
Production, RCA, MPUAT,
Udaipur, Rajasthan, India

Effect of feeding Azolla (*Azolla pinnata*) leaf powder on carcass and economic traits of turkey poults

Keshram Meena, Lokesh Gupta and Bhavya Pal

Abstract

The present study was planned to assess the “Effect of feeding Azolla (*Azolla pinnata*) leaf powder on carcass and economic traits of turkey poults (*Meleagris gallopavo*)”. A total of 128 day-old age turkey poults were randomly divided into four treatment groups with four replicates and 8 poults each. Control group (T₁) was fed on basal diet without azolla supplementation and three experimental diets were prepared by replacing basal diet with azolla meal at 2.5% (T₂), 5% (T₃) and 7.5% (T₄) levels. The dietary treatments were arranged in complete randomized design and analyzed for the carcass traits and economics of rearing turkey poults. The results attributed to improved live weight, eviscerated weight, dressed weight and B: C ratio. Based on the findings it can be concluded that Azolla leaf powder can be safely administered as unconventional feed ingredient in turkey feed up to 5 percent level without any adverse effect.

Keywords: Azolla, poults, live weight, organ and economics

Introduction

In India, turkey farming is in its infancy. To boost turkey farming, however, the Central Poultry Development Organization (Southern Region), Hessarghatta, Bangalore, is making significant efforts. The two states that produce the most turkeys are Kerala and Tamil Nadu. In the South, turkey farming is rapidly gaining in popularity. White meat consumption, which includes chicken and turkey, is rising quickly while red meat consumption is falling. Such a trend has also been observed in India. Compared to red meat and other types of poultry meat, turkey meat is lower in fat and cholesterol. Due to rivalry with traditional human food ingredients as a result of the amazing expansion in chicken production, conventional feed ingredients are in short supply and are becoming more expensive (CAST, 2013). Feed alone costs 65 to 75% of the total broiler production and ultimately results in high price of poultry meat (Johari and Hussain, 1996) [8]. Chicken has very limited ability to meet their protein needs from non-protein sources. Typical broiler ration will contain 22 to 24% protein. Protein synthesis in chickens is required at a very rapid rate for compensating the broken tissues of the adult body (Banerjee, 2000) [2].

Over the past few years, research on the use of green forages and feed has grown significantly. Turkeys are known to eat more green feed (vegetables) than other fowl. As a result, given that turkeys raised under intensive systems have no direct interaction with plant feeds, particularly green feeds, the feed component is very important. Additionally, due to competition with traditional human food resources, there is a lack of and an increase in the price of conventional feed ingredients as a result of the exponential increase in chicken production. Since the cost of the feed makes up almost 75% of the entire cost of producing a turkey, switching from conventional to unconventional feedstuffs will lower the cost of the turkey feed and raise the profit margin.

Methodology

Preparation of Azolla meal

The Poultry Farm, Department of Animal Production, Rajasthan College of Agriculture, MPUAT, Udaipur provided the Azolla culture. The water in the tank was covered with a fresh Azolla culture, which was harvested and collected after maturation. A brine solution was used to wash and dry the harvested azolla. Before adding it to the feed, the dried Azolla was ground with a grinder to a consistent size.

Corresponding Author:
Keshram Meena
Department of Animal
Production, RCA, MPUAT,
Udaipur, Rajasthan, India

Experimental bird details

The day-old turkey poulters were purchased for Rs 90 each from the hatchery section of the poultry farm inside the department of animal production of the Rajasthan College of Agriculture, MPUAT, Udaipur. They were divided into various dietary treatment groups and provided a base meal along with varying amounts of Azolla leaf powder. According to the composition of the materials and the current market prices of individual feed ingredients, the cost of feeding in various treatment groups was estimated.

Statistical analysis

The experiment was carried out using a completely randomized design (CRD), and Snedecor and Cochran's (1994) [14] analysis of variance was used to examine the data pertaining to various parameters that were gathered during the current study.

Results and Discussion

Carcass characteristics

The information on the carcass characteristics of the young turkeys in the various treatment groups is presented in Table 1. Significantly highest live weight was observed in T₃ (1225.77±26.93 g) and T₄ (1185.23±8.89 g), followed by T₂ (1024.44±9.56 g) and significantly lowest in T₁ (916.86±9.33 g). The difference between T₃ and T₄ were found statistically non-significant. The mean dressed weight was 711.94±4.22,

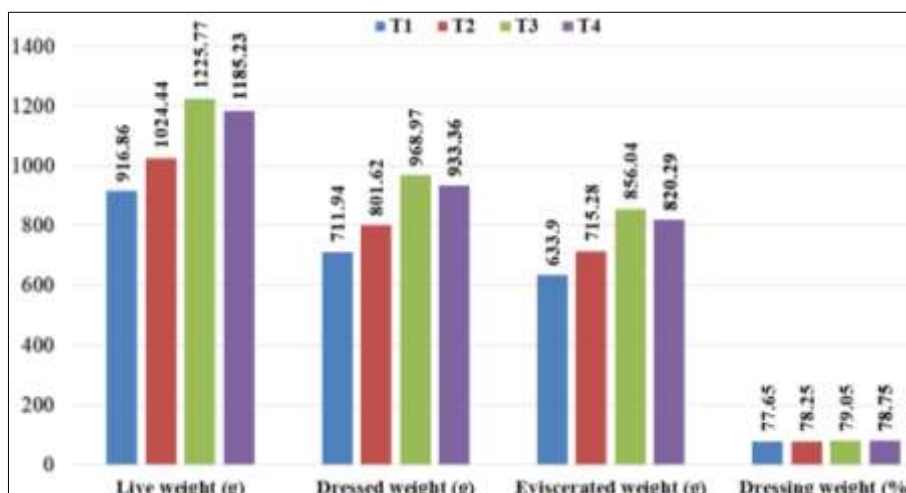
801.62±0.00, 968.97±1.83 and 933.36±4.76 g respectively in T₁, T₂, T₃ and T₄. Significantly highest dressed weight was observed in T₃ (968.97±1.83 g) followed by T₄ (933.36±4.76 g) followed by T₂ (801.62±0.00 g) and significantly lowest in T₁ (711.94±4.22 g). The eviscerated weight was significantly highest in T₃ (856.04±8.12 g) followed by T₄ (820.29±19.64 g), T₂ (715.28±19.49 g) and significantly lowest eviscerated weight was observed in T₁ (633.90±2.34 g). The differences between the various treatments were determined to be statistically insignificant. The differences in the weights of the liver, heart, and gizzard as a percentage of live weight between the various treatments were minimal and were deemed to be statistically insignificant.

The results obtained in current study fall in line with the findings of Naghshi *et al.* (2014) [11] observed that supplementation of 5% Azolla powder significantly ($p < 0.05$) increased the carcass efficiency and thigh relative percentage. Tawasoli *et al.* (2020) [15] reported positive and beneficial effects of herbals like Azolla meal feeding on dressing percentage up to 6% inclusion of Azolla in poultry diets which is in close agreement with the present study. Shinde *et al.* (2017) [13] revealed that supplementation of Azolla at the rate of 5% showed significant increase ($p < 0.05$) in dressing percentage which is closely in agreement with the results of present study. Kashyap *et al.* (2018) [10] and Bhattacharya *et al.* (2016) [4] reported there was no significant difference among the treatment groups on the carcass traits.

Table 1: Effect of feeding Azolla leaf powder on carcass traits of turkey poulters

Parameters / Treatments	T ₁	T ₂	T ₃	T ₄	SEm±	CD at 5%
Live weight (g)	916.86±9.33 ^c	1024.44±9.56 ^b	1225.77±26.93 ^a	1185.23±8.89 ^a	14.61	45.02
Dressed weight (g)	711.94±4.22 ^d	801.62±0.00 ^c	968.97±1.83 ^a	933.36±4.76 ^b	3.07	9.47
Eviscerated weight (g)	633.90±2.34 ^d	715.28±19.49 ^c	856.04±8.12 ^a	820.29±19.64 ^b	10.40	32.06
Dressing weight (%)	77.65±0.84	78.25±0.72	79.05±1.81	78.75±0.82	1.07	NS
Organ weight as percent of live weight						
Liver weight (%)	2.14±0.04	2.13±0.01	2.12±0.01	2.17±0.02	0.02	NS
Heart weight (%)	1.16±0.01	1.17±0.01	1.12±0.02	1.13±0.02	0.01	NS
Gizzard weight (%)	3.01±0.03	3.06±0.03	3.09±0.03	2.99±0.02	0.03	NS

Means with the same superscripts in a particular row do not differ significantly ($p < 0.05$) from each other.



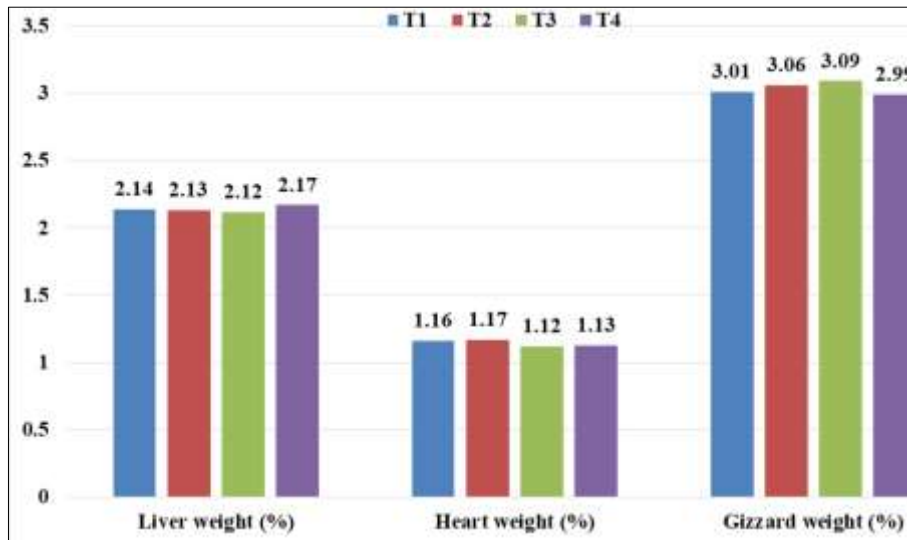


Fig 1: Effect of feeding Azolla leaf powder on carcass traits of turkey poult

Economics

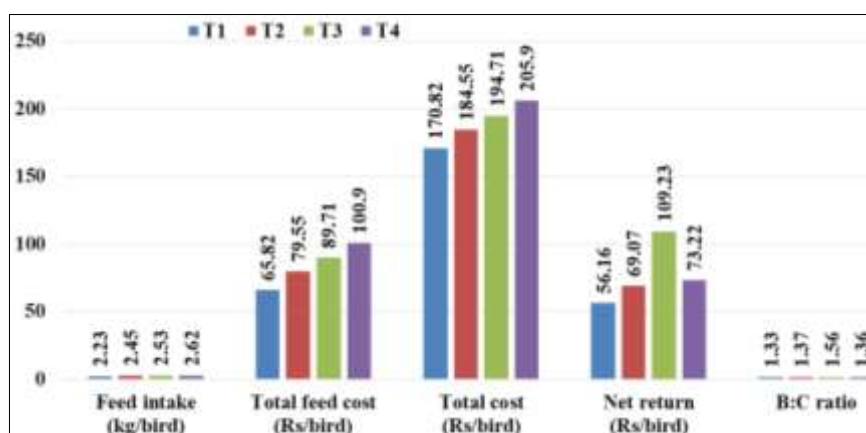
The data pertaining to economic parameters of turkey poult in different treatment groups are tabulated in Table-2. Feed efficiency during entire period of study was significantly higher in T₄ group which were fed with 7.5% ALP as compared to rest of the treatment groups. The total feed cost per poult was significantly higher in T₄ and significantly lowest feed cost was observed in T₁. B:C ratio was significantly higher in T₃ (5% Azolla) group. The results of present investigation revealed that inclusion of 5% Azolla had positive effect on economic performance of turkey. However, beyond this level (5% Azolla) slightly decrease in production parameter in terms of gross income and net income was reported in the present study. Data revealed that the benefit cost ratio was significantly highest in T₃ as compared to rest of the treatment groups. However, the difference in benefit

cost ratio among T₁, T₂ and T₄ was found to be non-significant. The present results are in agreement with those reported by Borkar *et al.* (2021) [5] who observed that feeding of Azolla meal up to 7.5% in Kadakanath poultry have positive impact in terms of profit as compared to control. Kamel and Hamed (2021) [9] reported significantly highest total return and net return on inclusion of 12% dried azolla in the ration of broilers. Shinde *et al.* (2017) [13] and Ara *et al.* (2015) [1] reported that net profit per bird was maximum in 5% Azolla fed treatment group and beyond this level there was decrease in term of profit in poultry farming. Rathod *et al.* (2013) [12] observed that the use of 7.5% Azolla meal is profitable as compare to other feeding groups. Dhumal *et al.* (2009) [7] and Basak *et al.* (2002) [3] reported that Azolla could be included up to 5% for better profit which is similar to findings of present study.

Table 2: Economics of rearing of turkey poult on feeding Azolla leaf powder

Parameters / Treatments	T ₁	T ₂	T ₃	T ₄	SEm±	CD at 5%
Poult cost (Rs/bird)	90	90	90	90		
Feed intake (kg/bird)	2.23±0.01 ^d	2.45±0.01 ^c	2.53±0.01 ^b	2.62±0.01 ^a	0.01	0.02
Total feed cost (Rs/bird)	65.82±0.16 ^d	79.55±0.25 ^c	89.71±0.36 ^b	100.90±0.09 ^a	0.21	0.65
Miscellaneous cost (Rs/bird)	15	15	15	15		
Total cost (Rs/bird)	170.82±0.16 ^d	184.55±0.25 ^c	194.71±0.36 ^b	205.90±0.09 ^a	0.21	0.65
Body weight (g)	907.92±3.08 ^d	1014.50±15.67 ^c	1215.76±19.85 ^a	1116.48±6.20 ^b	9.99	30.79
Gross income (Rs/bird)	226.98±4.62 ^d	253.62±9.17 ^c	303.94±3.95 ^a	279.12±1.93 ^b	4.54	13.99
Net return (Rs/bird)	56.16±4.62 ^c	69.07±9.00 ^{bc}	109.23±4.08 ^a	73.22±1.97 ^b	4.55	14.01
B:C ratio	1.33±0.03 ^b	1.37±0.05 ^b	1.56±0.02 ^a	1.36±0.01 ^b	0.02	0.08

Means with the same superscripts in a particular row do not differ significantly ($p < 0.05$) from each other.



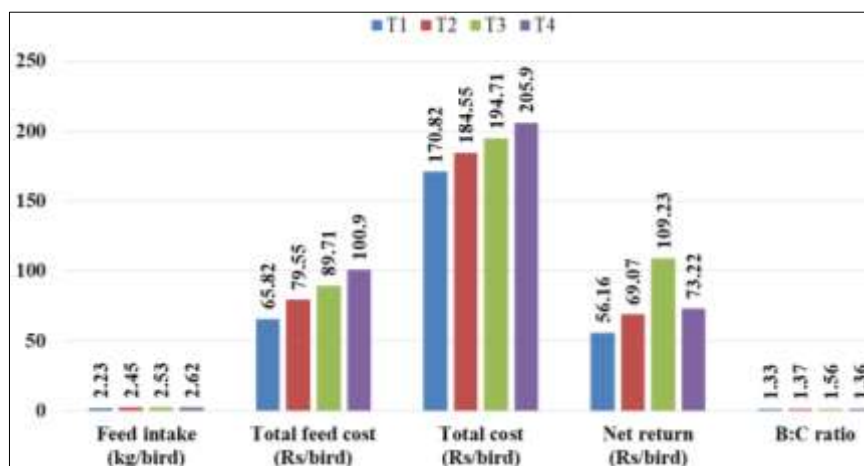


Fig 2: Economics of rearing of turkey poult on feeding Azolla leaf powder

Conclusion

From the experiment, it was concluded that, incorporation of Azolla leaf powder at 5% level in the diet improved live weight, dressed weight and eviscerated weight which was at par with standard basal diet. Inclusion of Azolla leaf powder at 5% level showed the maximum economic benefit.

Acknowledgment

The authors are thankful to the Dean, Rajasthan College of Udaipur, Head and Associate Professor, Department of Animal Production, for providing their infrastructure and scientific skills in carrying out the research work.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Ara S, Adilb S, Bandayb MT, Khan MA. Feeding Potential of Aquatic Fern Azolla in Broiler Chicken Ration. *Journal of Poultry Science and Technology*. 2015;3(1):15-19.
- Banerjee GC. *Poultry Oxford and IBH Publishing, India*; c2000.
- Basak B, Pramnik AH, Rahman MS, Taradar SU, Roy BC. Azolla (*Azolla pinnata*) as Feed Ingredient in Broiler Ration. *International Journal of Poultry Science*. 2002;1(1):29-34.
- Bhattacharyya A, Shukla PK, Roy D, Shukla M. Effect of Azolla Supplementation on Growth, Immunocompetence and Carcass Characteristics of Commercial Broilers. *Journal of Animal Research*. 2016;6(5):941-945.
- Borkar VD, Motghare AB, Bawaskar SS, Wankhade BR. Studies on feeding of Azolla meal on growth performance of Kadaknath poultry. *International Journal of Fauna and Biological Studies*. 2021;8(1):105-108.
- Council for Agricultural Science and Technology. *Animal Feed vs. Human Food: Challenges and Opportunities in Sustaining Animal Agriculture toward 2050*. Issue Paper, 53. Ames, Iowa: CAST; c2013.
- Dhumal MV, Siddiqui MBA, Avai PE. Performance on broiler fed on different levels of Azolla meal. *Indian Journal of Poultry Science*. 2009;44(1):65-68.
- Johari DC, Hussain KQ *Commercial Broiler Production*. International Book Distributing Company, Lucknow; c1996. p. 69.
- Kamel ER, Hamed E. Effect of dried Azolla on growth performance, hematological, biochemical, antioxidant parameters, and economic efficiency of broiler chickens. *Advances in Animal and Veterinary Sciences*. 2021;9(11):1886-1894.
- Kashyap SS, Shukla PK, Bhattacharyya A, Sirohi R. Effect of dietary inclusion of Azolla (*Azolla pinnata*) in raw and meal forms on the production performance, immunocompetence, development of digestive organs and carcass quality traits of coloured chicken. *Journal of Animal Research*. 2018;8(1):73-78.
- Naghshi H, Khojasteh S, Jafari M. Investigation the effect of different level of Azolla (*Azolla pinnata*) on the performance and carcass characteristics of cob broiler chicks. *International Journal of Farming and Allied Sciences*. 2014;3(1):45-49.
- Rathod GR, Tyagi PK, Tyagi PK, Mandal AB, Shinde AS. Feeding value of Azolla (*Azolla pinnata*) meal in growing Japanese quail. *Indian Journal of Poultry Science*. 2013;48(2):154-158.
- Shinde P, Prasade NN, Kumar S, Desai BG, Dhekale JS, Dandekar VS, *et al*. Chemical composition of Azolla (*Azolla pinnata*) and their exploring effects on the production performance of broilers. *International Journal of Chemical Studies*. 2017;5:858-862.
- Snedecor GW, Cochran WG. *Statistical Methods*, 8th edition, Iowa State University Press, Ames, Iowa, USA; c1994.
- Tawasoli MJ, Kahate PA, Shelke RR, Chavan SD, Shegokar SR, *et al*. Performance of Azolla (*Azolla pinnata*) Meal on Body Weight Gain and Dressing Percentage of Vanraja Poultry Birds. *International Journal of Current Microbiology and Applied Sciences*. 2020;9(7):4001-4008.