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Effect of feeding ginger (*Zingiber officinale*) powder on growth performance of Giriraja poultry birds in Konkan region

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Abstract

The objective of this study was to evaluate the impact of feeding ginger powder on the growth performance of Giriraja poultry birds in the Konkan region. A 200-day-old Giriraja birds, were distributed among four treatment groups, with 50 birds in each group. The experimental diets were formulated with varying levels of ginger powder: 0g/kg in T₁, 6g/kg in T₂, 12g/kg in T₃, and 18g/kg in T₄, added to the Starter-Grower feed. The findings indicated that incorporating 12g/kg of ginger powder into the feed of experimental birds resulted in superior outcomes compared to other treatments, specifically in terms of enhanced feed consumption, increased body weight gain, and improvement in the Feed Conversion Ratio (FCR).

Keywords: Ginger, Giriraja, growth performance, feed conversion ratio

Introduction

Poultry holds a crucial position in India, given that eggs and chicken meat serve as vital and nutrient-rich sources of protein, vitamins, and minerals such as iron, zinc, selenium, and vitamin B₁₂. Rearing chickens stands out as a well-suited endeavor for enhancing the livelihoods of the underprivileged, owing to its low capital requirement and the relative ease of setting up such a production system within rural communities. Among all the sectors of the Indian economy, the poultry industry is the one that is expanding the fastest. India ranks fifth globally in terms of the production of poultry meat and is the world's third-largest producer of eggs. From a small backyard business to a commercial, fully fledged, self-sufficient, and most progressive agro-based industry, the poultry industry has made incredible strides. It is now a highly desirable industry due in large part to its low capital requirements, high returns, low land requirements, quick turnover, relatively low risk, high production, and high feed efficiency.

Ginger, is one of the most widely used and well-liked spices. It serves as both a strong appetizer and a carminative with regard to its anti-asthmatic and gastrointestinal stimulant properties, it is considered a beneficial medicine (Zhang *et al.* 2009) [6].

Ginger (*Zingiber officinale*) is a spices that are most widely used. The results of the study demonstrated that the anti-hypercholesterolemia effect of ginger supplementation resulted in a lower the serum cholesterol level in poultry. Rhizomes of Ginger are a good source of micronutrients and pharmacologically active compounds that are beneficial to animal production by enhancing the animals' abilities to grow and reproduce. Hy-line brown eggs had improved laying performances as well as serum and antioxidant status. The primary ingredients in ginger are Gingerol, Gingerdiol, and Gingerdione, which have Enterokinetic properties and can stimulate the production of gastric secretions, circulation, and digestive enzymes.

The Karnataka Veterinary, Animal, and Fishery Sciences University in Bangalore, India, established the Giriraja breed of chicken. Another name for this breed is Bonda Chicken. High quality and abundant meat and eggs are produced by Giriraja, which can survive like any native stock with the exception of the regular ranked vaccination. Giriraja is, in a word, a miracle bird. Giriraja females produce 130-150 eggs a year, each weighing between 52 and 55 Grammes. The hatchability of the eggs is between 80 and 85 percent, which allows farmers to raise their own livestock. Giriraja is sturdy and highly resistance to disease, also reconciles to any region and weather condition and this breed is developed for the landless labour and for small scale farmers.

Materials and Methods

Treatments and Experimental design

'GIRIRAJA' birds acquired from the Kolhapur Government Hatchery. Individual chick weights were recorded before randomly assigning them to four treatment groups, each comprising 50 chicks. These groups were further divided into five replicates, each containing 10 chicks. All chicks originated from the same hatch and were raised under consistent management conditions until they reached twelve weeks of age. The experiment followed a Randomized Block Design and implemented specific dietary treatments. The control group (T₁) received a standard ration, while groups T₂, T₃, and T₄ were given the same standard ration supplemented with 6g, 12g, and 18g of ginger powder, respectively. This study took place at the poultry unit within the instructional farm of the Department of Animal Husbandry and Dairy Science at the College of Agriculture, Dapoli, Ratnagiri

district, Maharashtra.

Results and Discussion

Growth Performance

a) Feed Consumption (g/week)

Table 1 shows the impact of Ginger powder on feed consumption of Giriraja poultry birds and visually represented in Fig. 1. Treatment T₃ (birds fed with 12 g/kg of ginger powder) showed the highest average feed consumption of 422.17 g compared to treatment T₁ (420.73 g), treatment T₂ (419.56 g), and treatment T₄ (420.26 g). Treatment T₂ (419.56 g) also showed the lowest average feed consumption compared to other treatments. These findings are consistent with those of Arkan *et al.* (2012) [1] and Karangiya (2016) [3], who also reported that ginger impacts poultry bird growth performance and feed intake.

Table 1: Effect of feeding Ginger (*Zingiber officinale*) powder on Feed Consumption (g/bird) in different treatment groups

Treatment	Week												Mean
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	
T ₁	76.56	151.82	222.92	296.9	378.58	434.98	521.76	526.06	568.48	611.62	645.88	613.3	420.73 ^b
T ₂	75.90	150.80	223.28	297.44	382.78	438.96	525.24	526.26	565.30	611.92	624.90	611.96	419.56 ^b
T ₃	76.08	150.72	223.52	298.5	387.04	441.56	529.10	528.88	568.34	612.22	624.46	625.64	422.17 ^a
T ₄	76.34	151.84	223.28	297.9	383.42	437.82	523.34	524.28	565.5	611.82	623.44	624.24	420.26 ^b
S.Em	0.876	0.988	1.296	1.417	2.523	2.709	2.938	3.537	3.653	4.373	5.667	7.825	3.1501
C.D.	NS	3.045	3.9918	4.3649	7.7738	8.3471	9.0519	10.900	11.257	13.473	17.462	24.113	10.3435

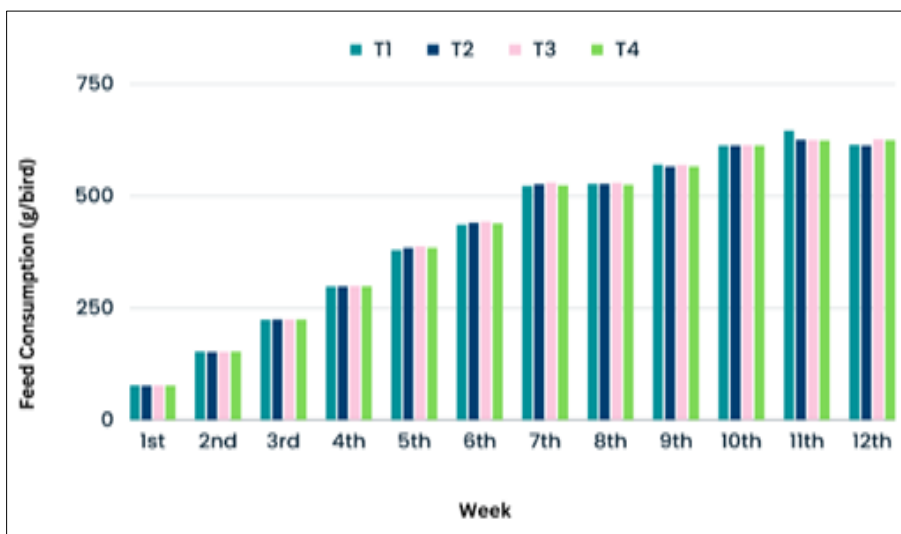


Fig 1: Feed Consumption (g/bird)

b) Body Weight (g/bird)

Giriraja birds' average weekly body weight was recorded, results are displayed in Table 2 and Fig. 2. The findings showed that, in comparison to the control group (T₁), the experimental birds treated with treatment T₃, (feeding them with 12g/kg of ginger powder in their ration), had a

significantly higher BW than the birds treated with treatment T₂ (6g/kg of ginger powder), and treatment T₄ (18g/kg of ginger powder). Similar results were reported by Talukdar *et al.* (2017) [5] and Arkan *et al.* (2012) [1], who noted that chickens showed increased weight gain when ginger meal was added to their diets at levels of 2 and 6%.

Table 2: Effect of feeding Ginger (*Zingiber officinale*) powder on Body Weight (g/bird) in different treatment groups

Treatment	Initial body weight	Week											
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
T ₁	35.40	68	146	242.6	367	535.2	730.6	936.2	1145.8	1326.6	1508.6	1698.6	1870.40 ^c
T ₂	35.60	74.4	166.8	279.8	424.4	617.4	813.6	1030.4	1240.6	1428.2	1615.8	1798	1964.60 ^b
T ₃	34.00	80.2	176.6	309.6	473.4	672.4	882.8	1098.8	1344	1557	1767.2	1979.4	2225.60 ^a
T ₄	35.40	71	162.2	265.2	419.8	606.6	805.6	1016.6	1235.4	1414	1598	1787.6	1970.0 ^b
S.Em	0.84	0.932	1.962	2.579	3.09	3.599	4.771	5.47	5.484	5.707	8.113	8.424	8.925
C.D.	NS	NS	6.046	7.945	9.521	11.089	20.609	16.854	16.898	17.856	24.999	25.958	27.499

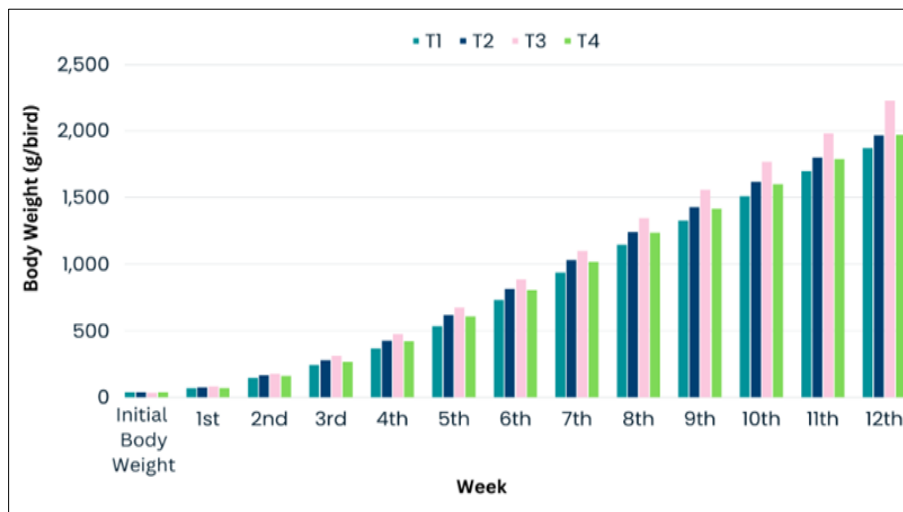


Fig 2: Body Weight (g/bird)

c) Body Weight Gain (g/week)

Weekly body weight gain of the Giriraja birds was measured and the results were displayed in Table 3 and Fig. 3. In treatments T₁, T₂, T₃, and T₄, the average total weekly body weight gain was 1835, 1929, 2191.6, and 1934.6 g per bird from the 1st to the 12th week. The results showed that, when compared to the T₁, T₂, and T₄ control groups, the treatment T₃, which consisted of feeding the birds with 16g/kg of ginger powder, resulted in the largest increase in body weight.

Treatment T₁, or the control group, showed the noticeably least amount of body weight gain compared to T₂, T₃, and T₄. It might be because ginger powder increases the amount of digestive juices, boosts absorption, and neutralises toxins and acid in the stomach. Similar results were reported by Rathod (2021) [4], who found that birds supplementing their diet with 1% ginger powder had the highest BWG, which was 269.93% higher than that of the control group.

Table 3: Effect of feeding Ginger (*Zingiber officinale*) powder on Body Weight Gain (g/week) in different treatment groups

Treatment	Week												Total
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
T ₁	37.6	75	96.6	124.4	168.2	195.4	205.6	209.6	180.8	182	190	169.8	1835 ^c
T ₂	39	92.4	113	144.6	193	196.2	216.8	210.2	187.6	187.6	182.2	166.4	1929 ^b
T ₃	42.8	96.4	133	163.8	199	210.4	216	245.2	213	210.2	212.2	249.6	2191.6 ^a
T ₄	42.2	91.2	103	154.6	186.8	199	211	218.8	178.6	184	189.6	175.8	1934.6 ^b
S.Em	0.987	1.946	3.695	3.092	4.21	5.218	5.283	5.881	5.165	6.176	6.229	8.596	56.478
C.D.	3.042	5.996	11.387	9.525	12.973	16.078	16.279	18.122	15.915	19.031	19.195	26.486	174.029

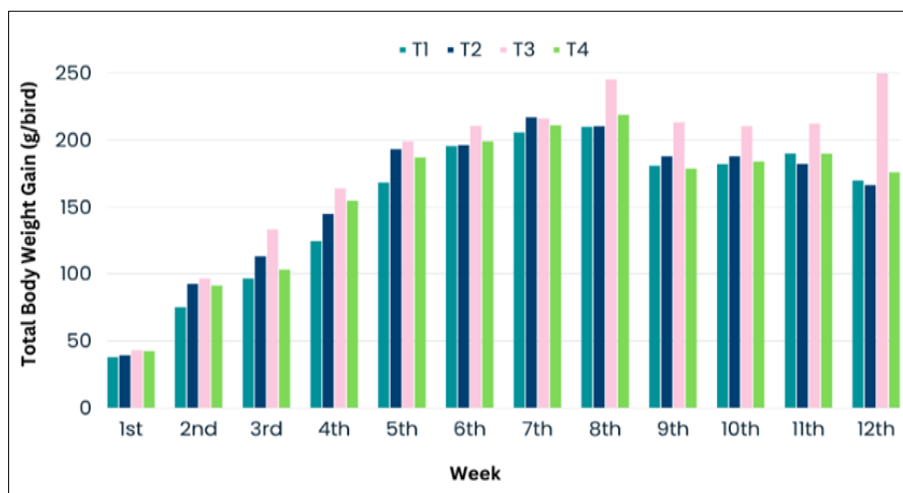


Fig 3: Body Weight Gain (g/bird)

d) Feed Conversion Ratio

The FCR ratio was displayed graphically in Fig. 4 and presented in Table 4. The results showed that the T₃ treatment had the highest feed conversion ratio of 2.22 (12 g/kg) followed by the T₂ treatment's 2.51 (6 g/kg) and the T₄ treatment's 2.56 (18 g/kg) feed conversion ratios. The T₁ (Control) treatment had the lowest feed conversion ratio. It

was demonstrated that the experimental birds' feed conversion ratio increased with treatment T₃. Similar findings were reported by Kairalla *et al.* (2022)², who added ginger powder to four different dietary treatments at levels of 0%, 0.2%, 0.4%, and 0.6%. When compared to the control group, the higher concentrations of ginger powder (0.4% and 0.6%), significantly ($p < 0.05$) improved final BW, BWG, and FCR.

Table 4: Effect of feeding Ginger (*Zingiber officinale*) powder on Feed Conversion Ratio in different treatment groups

Treatment	Week												Average
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	
T ₁	2.04	2.02	2.32	2.39	2.28	2.22	2.54	2.51	3.15	3.36	3.42	3.62	2.65 ^a
T ₂	1.94	1.63	1.97	2.06	1.98	2.24	2.42	2.50	3.01	3.27	3.43	3.68	2.51 ^b
T ₃	1.78	1.56	1.69	1.82	1.95	2.10	2.45	2.16	2.67	2.92	2.94	2.53	2.22 ^c
T ₄	1.814	1.66	2.18	1.93	2.05	2.20	2.48	2.40	3.17	3.33	3.30	3.59	2.56 ^{ab}
S.Em	0.047	0.039	0.071	0.038	0.056	0.056	0.062	0.067	0.079	0.1	0.102	0.132	0.0707
C.D.	0.146	0.118	0.218	0.115	0.173	0.174	0.191	0.205	0.362	0.309	0.315	0.404	0.2278

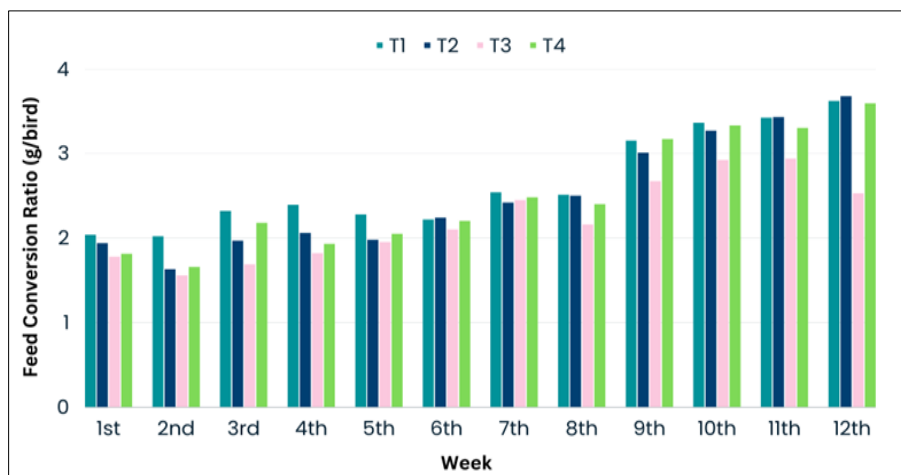


Fig 4: Feed Conversion Ratio

Conclusion

The study concluded that the inclusion of 12g/kg of ginger powder in the experimental bird feed outperformed other treatments. Results indicated that this particular treatment led to significantly higher body weight compared to the other groups. This enhancement might be attributed to ginger's active compounds like Gingerol, phenolics, gingerdione, Gingerdiol, and the presence of phytobiotics active components. Observations suggested that the increased body weight gain could be linked to heightened digestive fluids, improved absorption, enhanced blood circulation, and the neutralization of toxins, collectively contributing to the boost in body weight. Furthermore, the treatment with 12g/kg of ginger powder exhibited a lower feed conversion ratio compared to the other treatments. Additionally, lower morbidity rates and zero mortality were observed in this particular treatment group in contrast to the others.

References

1. Arkan BM, AL-Rubae MAM, Ali QJ. Effect of ginger on performance and blood serum parameters of broiler. *Int. J of Poult. Sci.* 2012;11(2):143-146
2. Kairalla MA, Aburas AA, Alshelmani MI. Effect of Diet Supplemented with Graded Levels of Ginger (*Zingiber officinale*) Powder on Growth Performance, Hematological Parameters, and Serum Lipids of Broiler Chicken Arch Razi Inst. 2022 Dec;77(6):2089-2095.
3. Karangiya VK, Savsani HH, Patil SS, Garg DD, Murthy KS, Ribadiya NK, *et al.* Effect of dietary supplementation of garlic, ginger and their combination of feed intake, growth performance and economics in commercial broilers. *Vet. World.* 2016;9:245-250.
4. Rathod AV, Mane SH, Kankhare DH, Adangale SB. Effect of dietary inclusion of ginger (*Zingiber officinale*) and thyme (*Thymus vulgaris*) powder on growth performance, carcass traits, blood metabolites and

economics of Giriraja. *The Pharma Innovation J.* 2021;10(5):495-499.

5. Talukder S, Hasan MM, Al Noman Z, Sarker YA, Paul TK, Sikder MH. Effect of dietary supplementation of ginger extract on growth, carcass characteristics and haematological parameters in broilers. *Asian J of Medi. and Bio. Res.* 2017;3(2):211-215.
6. Zhang GF, Yang ZB, Wang Y, Yang WR, Jiang SZ, Gai GS. Effect of ginger root *Zingiber officinale* process to different particle sizes on growth performance, antioxidant status and serum metabolites of broiler chickens, *Poultry Sci.* 2009;88:2159-2166.