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Effect of diets supplemented with garlic (*Allium sativum*) and holy basil (*Ocimum sanctum*) leaf powder on economics of production of broilers

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Abstract

A six weeks trial was conducted to study the effect of diets supplemented with garlic and holy basil leaf powder on economics of production of broilers. A total of 280-day-old commercial broiler chicks (Vencobb-400) were randomly allocated into seven treatments with four replicates and each replicate had ten chicks. Growth trial was conducted in complete randomized design. T₁ was served as control and fed a basal diet formulated as per ^[3] standards. T₂ and T₃ were fed with garlic powder @ 0.5, 1% feed, respectively. T₄ and T₅ were given with holy basil leaf powder @ 0.5, 1% feed, respectively. T₆ was fed with garlic powder and holy basil leaf powder @ 0.5% each. T₇ was treated with garlic powder and holy basil leaf powder @ 1.0% each. The results showed that The relative profit (Rs.) as compared to control (T₁) was found only in treatment T₆ (0.78), where feed supplemented with combination of 0.5% garlic and 0.5% holy basil leaf powder. Thus, the present study revealed that supplementation of garlic powder and holy basil leaf powder @ 0.5% each in the broilers diet represent the best economic option to local farmers in these research conditions.

Keywords: Garlic, holy basil, broiler, relative profit, economic

Introduction

The basic objectives of modern broiler farming are faster growth, high feed conversion efficiency and livability. The economics of production is very important criteria for broiler production where feed is the major important factor affecting the productive performance and economics of broiler production, next to genetic potential. The marketing age of broilers decreases by an average of 0.75 days for the same performance every year. Nutrition plays a vital role in enabling this improvement as the feed cost represents an expensive input of 70-80% of broiler production cost ^[1]. To ensure more net return and to minimize high expenditure on feed are the main challenges, for which many research strategies have been practiced such as introducing feed supplements and feed additives.

Recent research works on herbs / phytobiotic as feed additive have shown encouraging results with regards to weight gain, feed efficiency, intestinal microbes, intestinal morphology, lowered mortality and increased liveability in poultry ^[5, 6, 10]. Broiler diets supplemented with plant extracts have resulted in better returns of investment compared with the control ^[2, 9]. Thus, the present study was planned to determine the economic effect of diets supplemented with garlic and holy basil leaf powder on growth performance of broilers.

Materials and Methods

A total of 280-day-old commercial broiler chicks (Vencobb-400) were procured and randomly distributed into seven treatment groups of 40 chicks each. Each treatment groups was further subdivided into four replicates of ten chicks each. The herbs used in the study were purchased from local market. The experimental diets (Table 1) were formulated to meet the nutrient recommendations ^[3]. Growth trial of 6 weeks was conducted in a complete randomized design comprising seven dietary treatments. T₁ was served as control and fed a basal diet formulated as per ^[3] standards. T₂ and T₃ were fed with garlic powder (GP) @ 0.5, 1% feed respectively. T₄ and T₅ were given with holy basil leaf powder (HBLP) @ 0.5, 1% feed respectively. T₆ was fed with garlic powder (GP) and holy basil leaf powder (HBLP) @ 0.5% each. T₇ was treated with garlic powder (GP) and holy basil leaf powder (HBLP) @ 1.0% each.

The chicks were kept hygienically on floor litter system in separate pens. All the birds were reared adopting uniform management conditions. The chicks were brooded at 35 °C during the first week and thereafter the temperature was reduced by 3 °C every week until the temperature reached 25±1 °C. The birds were vaccinated against prevailing diseases adopting a standard protocol. Economics was found out by calculating the total production cost by knowing amount of feed consumed, cost of feed and cost of chick.

Then relative profit/loss was calculated by knowing the gross return per bird at 6 weeks of age.

The data were analyzed using completely randomized design [8] and using general linear model procedure of statistical package for social sciences 20th version software (SPSS) and comparison of means tested using Duncan's multiple range test [4] and significance was considered at five per cent level of probability ($P<0.05$).

Table 1: Ingredient (%) and chemical composition (% DM basis) of basal diet

Feed ingredient	Starter diet	Finisher diet
Maize (kg)	53	57
Soybean meal (kg)	19	16
Rice police (kg)	3	4
Ground nut cake (kg)	12	11
Fish meal (kg)	7	5
Soybean oil (kg)	4	5
Mineral mixture (kg)	2.0	2.0
*Feed additives (kg)	0.29	0.29
Chemical composition (% DM basis)		
Crude protein %	22.04	20.08
Crude fibre %	3.61	3.32
Ether extract %	8.38	8.98
Total ash %	6.18	5.86
**Metabolizable energy (Kcal/kg)	3056	3163

*Feed additives include Vitamin Mixture-I-10 g, Vitamin, Amino acid and Ca mixture-II 20 g, Coccidiostat (Dinitro-0-Toluamide)-50 g, Choline chloride-50 g, Lysine-50 g, DL- methionine-80 g and Chlortetracycline -33.5g/100kg; ** Calculated values - BIS (2007)

Result and Discussion

Table 2: Economics of broiler production under different dietary treatments

Treatments	Chick cost Rs./bird	Cost of feed/bird				Total production cost* Rs.	Live weight at 6 weeks of age g	Gross return** Rs./bird	Profit or loss Rs./bird	Relative profit or loss/bird*** Rs.
		0-3 Weeks		4-6 Weeks						
		Feed intake g	Feed cost Rs.	Feed intake g	Feed cost Rs.					
T ₁	29.75	968.50	30.32	2803.25	86.65	146.72	1846.75	166.20	19.48	---
T ₂	28.18	935.00	33.86	2778.25	99.54	161.58	1869.00	168.21	6.63	-12.87
T ₃	27.46	917.00	37.79	2770.25	113.11	178.36	1919.50	172.75	-5.61	-25.09
T ₄	27.46	934.75	33.95	2711.00	97.40	158.81	1864.50	167.80	8.99	-10.49
T ₅	26.78	923.25	38.24	2711.00	111.23	176.25	1910.25	171.92	-4.33	-23.81
T ₆	26.78	914.75	37.79	2712.75	111.03	175.60	2176.25	195.86	20.26	0.78
T ₇	26.78	941.25	48.39	2699.00	137.73	212.90	2140.75	192.66	-20.24	-39.72

*Production cost includes chick cost and total feed cost

**Bird sold @ Rs. 90/kg live weight

***Profit or loss in comparison to control

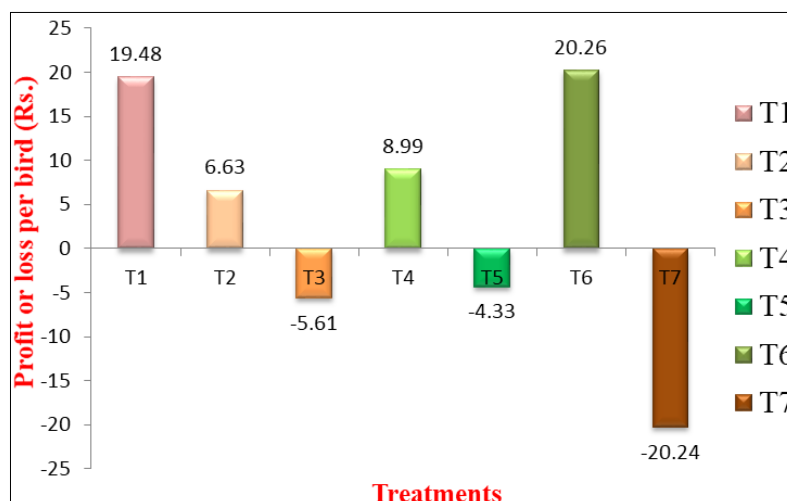


Fig 1: Economics of broilers production under different dietary treatments.

The results of the present study depicted that maximum profit of Rs. 20.26 per kg live weight was obtained in T₆ (0.5% garlic powder + 0.5% holy basil leaf powder) group compared to T₁ (control) group (Table 2). The relative profit to the control was also highest in T₆ (Rs. 0.78). The higher relative profit in 0.5% garlic powder + 0.5% holy basil leaf powder supplemented diet in comparison to other treatments was due to lowered mortality of birds which resulted in the reduced chick cost and this treatment also recorded higher body weight gain, resulted in highest gross returns per bird. The results pertaining to the economics are in agreement with latest report by ^[7] who indicated that from economic point of view feed containing tulsi leaf powder was better due to significantly lower feed consumption and improved feed conversion ratio.

Conclusion

It was concluded that supplementation with the combination of garlic and holy basil leaf powder in broilers diet based on the principles of economic production, it would be advisable to engage in diet supplement on garlic and holy basil leaf powder as the basal diet proves to be economically better.

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