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Combined effect of drumstick (*Moringa olifera*) and lemongrass (*Cymbopogon citratus*) on growth performance of broilers

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Abstract

An experiment was conducted at poultry unit in college of Agriculture Latur, to determine the combined effect of Drumstick (*Moringa olifera*) and Lemongrass (*Cymbopogon citratus*) powder on growth performance and economical of feeding. Eighty day- old chicks were divided into four dietary treatments i.e., T₁: Basal diet feeding, T₂: Basal diet+ 0.5% Drumstick powder, T₃: Basal diet+0.5% Lemongrass powder and T₄: Basal diet +0.5% Drumstick+ 0.5% Lemongrass powder of combination with four replication and five birds have each replication. Result of experiment showed significant difference ($P<0.05$) in feed intake, live weight, body weight gain and feed conversion ratio between treatments. The study concluded that addition of drumstick powder at the 0.5 per cent and 1 per cent mixture of Drumstick and lemongrass in broiler diet improved growth performance of broiler and economical and profitable for broiler production.

Keywords: Broilers, economics, FCR, natural feed additives, weight gain

Introduction

Antibiotics have been used widely to prevent infections and poultry diseases and for the improvement of meat and egg production. However, use of antibiotics is restricted due to drug resistance in bacteria, drug residue in carcass and also alteration of natural gut micro flora. Recently many countries tend to minimize or prohibit the use of antibiotics because of their deleterious side effects on both animals and human. Consequently, the use of natural promoters such as probiotics, prebiotics, symbiotics, enzymes, toxic binders, organic acids, oligosaccharides, phytochemicals, and other feed additives, to enhance the growth and performance of broiler chickens have been advocated compounds. The lemongrass metabolites as oil (LGO) is considered as a viable alternative to antibiotics for the broiler and have been studied as an alternative for microbial and growth promoting abilities in the poultry and that resulted minimized feed expense in the production chain Drumstick (*Moringa olifera*): Moringa is a potential plant that could be used to enhance immune response and to improve intestinal health of broiler chicken. The leaves of *Moringa* has high protein content which is between 20-33% on a dry weight basis, the protein is of high quality having significant qualities of all the essential amino acid

Materials and Methods

The present research work was undertaken to study the combined effect of drumstick and lemongrass supplementation on growth performance of broilers. The present study was carried out in the Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra state. Day old eighty, commercial straight run broiler chicks (Vencobb-430) strains were obtained from Huma hatcheries Latur (Maharashtra). Weighted (46.71±0.02g) and randomly allocated into four treatments groups with four replications and each replication have with five birds.

Experimental design

The concentration of the administered Additives in four experimental diets were as follows: T₁ - Standard broiler ration without supplement (control), T₂ - 99.50 part standard broiler ration + 0.5 part drumstick leaf meal, T₃ - 99.50 part standard broiler ration + 0.5 part lemongrass leaf meal and T₄ - 99.00 part standard broiler ration + 0.5 part mixture of drumstick leaf meal +

0.5part of lemongrass leaf meal. The herbal growth promoter (Drumstick and Lemongrass) was obtained from local market of Latur Dist, Latur, Maharashtra. Weekly growth of chicks and daily feed consumption in each group were recorded up to six week period. Feed conversion efficiency (FCR) was calculated as the ratio between unit feed consumed to unit body weight gain. The data generated from the experiment were subjected to statistical analysis using randomized block.

Birds Management

Day old eighty, commercial straight run broiler chicks (Vencobb-430) strains were obtained from Huma hatcheries Latur (Maharashtra). Weighted (46.71+0.02g) and randomly allocated into four treatments groups with four replications and each replication have with five birds. The concentration of the administrated Additives in four experimental diets were as follows: T₁ - Standard broiler ration without supplement (control), T₂ - 99.50 part standard broiler ration + 0.5 part drumstick leaf meal, T₃ - 99.50 part standard broiler ration + 0.5 part lemongrass leaf meal and T₄ - 99.00 part standard broiler ration + 0.5 part mixture of drumstick leaf meal + 0.5part of lemongrass leaf meal. The herbal growth promoter (Drumstick and Lemongrass) was obtained from local market of Latur Dist, Latur, Maharashtra. Birds were vaccinated routinely against infectious new castle Disease (Iasota) 7thday vaccine by intraocular route, 14thday Gambaro vaccine by intraocular route and 21thday Booster dose of Lasota vaccine through intraocular route. The experimental diets and drinking water were provided ad libitum. The present research work was undertaken to study the combined effect of drumstick and lemongrass supplementation on growth performance of

broilers. The present study was carried out in the Department of Animal Husbandry and Dairy Science, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra state. throughout the experimental period of six week. All chickens were maintained at uniform temperature and lighting control system during the whole period of study. Weekly growth of chicks and daily feed consumption in each group were recorded up to six week period. Feed conversion efficiency (FCR) was calculated as the ratio between unit feed consumed to unit body weight gain. The data generated from the experiment were subjected to statistical analysis using randomized block.

Proximate Analysis

Proximate analysis of drumstick and lemongrass leaf meal were performed for the components of dry matter, crude protein, ether extract, crude fiber and ash, Proximate analysis of drumstick and lemongrass leaf meal were performed for the components of dry matter, crude protein, ether extract, crude fiber and ash, according to In Table 2 showed chemical composition of natural feed additives. Diets formulated to meet the nutrient requirements of broilers according to the recommendations of Ross Broiler manual.

Results and Discussion

To asses combined effect of drumstick and lemongrass, Feed intake and FCR of Eighty, day old, broiler improved strain (Vencobb 430) were distributed in to four equal groups with four replication of 20 chicks. The experimental broiler chicks were reared as per standard on deep litter system in well ventilated shed from 0-6 weeks.

Table 1: Per cent chemical composition of experimental broiler ration on dry matter basis

Sr. No.	Nutrients	Per cent in ration		
		Pre-starter	Starter	Finisher
1.	Crude protein	23.35	21.64	20.20
2.	Crude fiber	3.92	3.96	3.99
3.	Ether extract	4.95	5.08	5.12
4.	Total ash	6.2	6.1	5.93
5.	Acid insoluble ash	1.57	1.60	1.62
6.	Nitrogen free extract	61.58	63.22	64.76
7.	Metabolizable energy (kcal/kg)	2982.5	3065.7	3198.8
8.	E/P ratio	127.73:1	141.66:1	158.35:1

Feed intake (g/bird)

The total average feed consumption per bird ranged from 4280.01 g to 4660.79 g during experimental period of 6 week. Were non significant differences among the all treatment groups except fourth and fifth week. At the end of experiment the total feed consumed by different treatment groups broiler chicks as T₂ group consumed significantly ($P < 0.05$) lower quantity of feed (4280.01 g) as compared to T₁ (4660.79 g) and T₃ (4645.43 g). It could be seen that highest feed consumption of 4660.01 g was obtained in T₁ control group

broilers followed by 4645.43 g with receiving 0.5 per cent lemon grass leaf meal in T₃, 4290.48 g in T₄ and lowest feed consumption i.e. 4280.01 g in T₂ at the end of 6th week. It showed that the birds fed with 0.5% level in addition of drumstick leaf meal had lowest feed consumption rate in the broiler birds. The results are in agreement with different a worker who has that reported that herbals additions in the broiler's diet had a significant positive effect on feed consumption.

Table 2: Feed intake of broiler chicks (g/bird) as affected by addition of drumstick and lemongrass leaf meal

Items	Drumstick				SE	Level of Sig.
	0%	0.5%	Lemongrass 0.5%	Drumstick + lemongrass 1%		
1 st week	160.75	148.00	155.00	150.00	8.07	N.S
2 nd week	330	312	328	314	17.17	N.S
3 rd week	720	690	718.30	692	26.74	N.S
4 th week	1128.02	1020.81	1124.21	1022.20	30.02	*
5 th week	1146.05	1042.49	1144.58	1042.81	30.19	*
6 th week	1176.02	4280.01	4645.43	4290.48	36.83	*

Total	4660.79	4280.01	4645.43	4290.48	64.17	*
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NS = no significant difference ($P>0.05$) *Significant different ($P<0.05$)

Average feed conversion ratio (FCR)

Experimental birds in T₁ group showed significantly ($p<0.05$) higher average FCR as compare to T₂, T₃ and T₄ groups the average feed conversion ratio from first to sixth week ranged from 1.65 to 1.96 which was significantly ($P<0.05$) higher in T₁ (1.96) as compared to T₂ (1.65), T₄ (1.67) where as at par with T₃ (1.91) group. the best feed conversion ratio of 1.65 obtained in T₂ group broilers inclusion of 0.5 per cent drumstick leaf meal followed by 1.67 with 1 per cent mixture of drumstick and lemongrass leaf meal in T₄, 1.91 in T₃ group

inclusion of 0.5 per cent lemon grass leaf meal and poor in feed conversion i.e. 1.97 in T₁ control at the end of 6th week. The results obtained in the correspondence with the results of this may be attributed to birds fed with drumstick leaf meal based diets adequately utilized the nutrients they consumed. Results of this experiment are synergetic effect of herbal mixture of drumstick and lemon grass and reported significant effect ($P<0.05$) on live weight and feed conversion on broiler ration.

Table 3: Effect of natural feed additives on feed conversion ratio of broiler chicks

Items	0%	Drumstick	lemongrass	Drumstick + lemongrass	SE	CD at 5%
1 st week	1.19	1.02	1.13	1.06	0.05	N.S.
2 nd week	1.27	1.15	1.25	1.27	0.06	N.S.
3 rd week	1.80	1.64	1.69	1.64	0.06	N.S.
4 th week	2.26	1.89	2.23	1.90	0.05	*
5 th week	2.57	1.76	2.29	1.78	0.05	*
6 th week	1.87	1.72	1.94	1.73	0.03	*
Total	1.96	1.65	1.91	1.67	0.03	*

NS = no significant difference ($P>0.05$) *Significant different ($P<0.05$)

Conclusion

The addition of 0.5 per cent of drumstick in broiler diet improved feed conversion ratio. The addition of mixture of 1 per cent mixture drumstick and lemon grass in broiler diet increases the level of water intake weekly.

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