



SHORT COMMUNICATION

Effect of Feeding Turmeric and Amla on Dressing Percentage and Meat Bone Ratio of Broilers

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ABSTRACT

An experiment was conducted to study the inclusion of turmeric, amla and their combinations on production performance, viz., weight gain, feed intake, feed conversion ratio, dressing percentage and meat bone ratio for a period of six weeks with seventy commercial, straight run day-old Vencobb-400 broiler chicks. These chicks were randomly grouped into seven treatments with ten chicks each. The treatment groups consisted of a basal diet (control, T_0), supplemented with either 0.25% turmeric (T_1), 0.50% turmeric (T_2), 0.25% amla (T_3), 0.50% amla (T_4), 0.25% turmeric+amlam (T_5) and 0.50% turmeric+amlam (T_6). The weight of heart, liver and gizzard increased slightly with supplementation of turmeric and amla which were non-significant. The higher dressing percentage (72.20 %) and meat bone ratio (14.36%) were observed in T_6 on per cent live weight basis. The net profit was recorded in T_6 (54.74 ₹/bird) and T_5 (₹ 54.51/bird) as compared to other treatment groups.

Key words: Broilers, Cost, Dressing, Meat bone ratio, Mortality, Percentage

As a primary source of animal protein, the poultry sector offers a valuable repository to bridge the gap between demand and the availability of balanced nutrition. Poultry production, particularly broiler production, is the quickest way to increase the availability of high quality protein for human consumption. Since the feed cost alone contributes to about 70-75% of the total cost of production, economic poultry production is, therefore, possible only when the feed cost is reduced and efficiency of feed utilization is increased (Pervez *et al.* 2011). Therapeutic properties of turmeric include anti-oxidant, anti-diabetic, antibacterial, antifungal, antiprotozoal, antiviral and hypocholesteremic activities (Ahmadi, 2010). Turmeric supplementation has been reported to improve the body weight gain and feed consumption of broiler chicken. (Osawa *et al.*, 1995). Amla (*Embellica officinalis*) is one of the richest sources of vitamin C and vitamin E. A combination of these two could boost the performance of broiler chicken. Hence, this research work was designed in broilers by including different levels of turmeric, amla and their combinations to study the dressing percentage and meat bone ratio in broilers.

The present experiment entitled was carried out at poultry unit, Department of Animal Husbandry and Dairy Science, College of Agriculture, Pune. The

experimental diet was formulated according to the standards prescribed in Bureau of Indian Standards (BIS, 1992). Seventy day-old commercial straight run broiler chicks of “Ven-cobb-400” strain were procured from Venkateshwara Hatchery, Pvt. Limited, Pune, Maharashtra. These chicks were randomly and equally distributed into seven treatment groups as T_0 , T_1 , T_2 , T_3 , T_4 , T_5 , and T_6 , with 10 numbers of chicks in each group. The treatment groups consisted of a basal diet (control, T_0), supplemented with either 0.25% turmeric (T_1), 0.50% turmeric (T_2), 0.25% amla (T_3), 0.50% amla (T_4), 0.25% turmeric+amlam (T_5) and 0.50% turmeric+amlam (T_6). All experimental chicks were reared on deep litter system in pens up to 6 week of age. The standard managerial practices were provided to the experimental birds. All the broiler chicks were fed with ground maize for first two days of age. For the experiment, a commercial broiler pre-starter, starter and finisher crumbles was used. Pre-starter (0-2 wks), starter (3-4 wks) and finisher rations (5-6 wks) were used during experimental period of 6 wks. The diets was fed *ad-libitum* to experimental groups by adding required amount of turmeric and amla powder as per treatment. At the end of the trial, two birds per treatment group were randomly picked up and slaughtered as per the method of Arumugam and Panda

Table 1. Details of dietary treatments

Treatment	Composition of experimental diets
T ₀	Basal diet (Control group)
T ₁	Basal diet + turmeric powder @ 0.25%
T ₂	Basal diet + turmeric powder @ 0.50%
T ₃	Basal diet + amla powder @ 0.25%
T ₄	Basal diet + amla powder @ 0.50%
T ₅	Basal diet + turmeric and Amla powder @ 0.25%
T ₆	Basal diet + turmeric and Amla powder @ 0.50%

(1970). The pre-slaughter live weight, eviscerated carcass weight, heart weight, liver weight and gizzard weight were recorded.

The highest heart weight (18.00 g) was obtained in group T₃ in which diets of the birds were supplemented with 0.25% amla, but difference was non-significant among other groups. The highest liver weight (50.00 g) was obtained in T₀ in which birds were fed basal diet, whereas, highest gizzard weight (98.00 g) was obtained in group T₆ in which supplementation of basal diet was done with 0.50% amla and turmeric powder. Carcass yield of different dietary treatments did not differ significantly among the group. However,

the best feed efficiency ($P < 0.01$) was noticed in 0.25% amla and turmeric powder and 0.50% combination groups compared to control group (Table-4). Dietary supplementation of turmeric and amla powder at both levels (0.25% and 0.50%) did not have any adverse effect on feed intake in broiler.

The effect of feeding turmeric and amla powder either alone or in combination on dressing percentage and meat bone ratio is presented in table 5. Significantly ($P < 0.01$) higher dressing percentage was observed in T₆ (72.20 %) followed by T₅, T₃, T₂, T₁, T₄ and T₀ treatments. Durrani *et al.* (2006) reported higher dressing percentage, breast and giblet weight in broilers fed diet containing 0.5 percent turmeric. Similarly, Singh *et al.* (2007) also reported that supplementation of amla and turmeric powder (@ 5 g/kg of feed) in broiler diet improved dressing percentage in broilers. Higher meat bone ratio was observed in T₆ (14.36) which was statistically significant ($P < 0.05$). Results indicated that dietary inclusion of turmeric and amla at the rate of 0.25% and 0.50% had significant positive effect in terms of dressing percentage and meat bone ratio in commercial broilers.

Results indicated that dietary addition of combination of turmeric and amla powder at the rate of

Table 2. Composition of pre-starter, starter and finisher feed

Ingredient	Pre-Starter	Starter	Finisher
Maize	51.95	63.25	62.45
Jowar	3.00	3.00	3.00
Bajra	7.00	0.00	4.05
Maize gluten	3.00	3.00	3.00
Meat cum bone meal	3.00	3.00	3.00
Rape seed DOC	1.00	0.00	1.00
Soybean DOC	28.06	24.9	20.06
Chicken meat meal	0.00	0.00	1.00
Lime stone powder	0.64	0.835	0.225
Di- calcium phosphate	0.595	0.455	0.68
Sodium bicarbonate	0.10	0.13	0.10
Free flow iodised salt	0.22	0.205	0.245
Broiler (Pre St./Strt./Finisher) premix	1.335	1.125	1.09
Choline chloride-60%	0.10	0.10	0.10
Total	100.00	100.00	100.00

Table 3. Effect of turmeric and amla (powder) on carcass traits in broilers (live weight basis in gram)

Treat.	Heart	Liver	Gizzard
T ₀	16.00±2.00	50.00±1.00	81.00±2.00
T ₁	14.00±0.00	42.00±2.00	86.00±6.00
T ₂	14.00±1.00	40.00±1.00	92.00±3.00
T ₃	18.00±1.00	46.00±2.00	92.00±1.00
T ₄	16.00±0.00	44.00±2.00	86.00±4.00
T ₅	16.00±1.00	42.00±2.00	96.00±2.00
T ₆	14.00±01.00	48.00±3.00	98.00±2.00

Table 4. Effect of turmeric and amla (powder) on feed intake (g/bird) and FCR of broilers

Average weekly feed intake (g/bird)								
1 st	147.80±2.11	149.65±1.10	149.45±1.05	146.60±2.41	147.10±1.71	149.35±1.13	145.60±1.76	NS
2 nd	357.55±1.30	352.35±2.81	355.60±1.87	356.95±0.43	357.10±1.05	354.50±0.56	352.15±1.60	NS
3 rd	654.15±1.23	636.75 ^{ab} ±3.53	641.95 ^b ±2.25	641.35 ^{ab} ±3.01	634.80 ^a ±0.99	650.00 ^c ±1.03	651.80 ^c ±1.40	6.61 ^{**}
4 th	853.95±1.92	852.20 ^{bc} ±0.74	845.20 ^a ±2.49	849.65 ^{abc} ±1.02	851.70 ^{bc} ±1.29	849.15 ^{ab} ±1.06	845.15 ^a ±1.92	4.72 ^{**}
5 th	1039.20 ^b ±2.81	1028.35 ^a ±2.55	1028.05 ^a ±2.79	1037.00 ^b ±0.66	1037.90 ^b ±0.71	1036.85 ^b ±1.64	1027.95 ^a ±2.05	6.80 ^{**}
6 th	1162.40 ^c ±1.22	1160.85 ^c ±0.75	1155.45 ^{ab} ±2.10	1152.50 ^a ±1.81	1161.25 ^c ±0.81	1159.90 ^{bc} ±1.31	1152.30 ^a ±1.98	4.62 ^{**}
0 to 6 th	4215.05±1.77	4180.15±1.91	4175.70±2.09	4184.05±1.56	4189.85±1.09	4199.75±1.12	4174.95±1.78	-
Average weekly FCR								
1 st	0.97±0.01	0.95±0.00	0.94±0.00	0.94±0.01	0.95±0.01	0.97±0.00	0.94±0.01	NS
2 nd	1.19±0.04	1.17±0.01	1.11±0.01	1.15±0.06	1.19±0.03	1.17±0.04	1.10±0.02	NS
3 rd	1.38 ^{cd} ±0.01	1.32 ^{bcd} ±0.01	1.37 ^{cd} ±0.02	1.38 ^c ±0.03	1.30 ^{abc} ±0.02	1.28 ^{ab} ±0.04	1.24 ^a ±0.02	0.07 ^{**}
4 th	1.62 ^b ±0.04	1.42 ^b ±0.04	1.38 ^{ab} ±0.04	1.34 ^{ab} ±0.04	1.30 ^a ±0.05	1.30 ^a ±0.03	1.36 ^{ab} ±0.01	0.11 ^{**}
5 th	1.79 ^b ±0.04	1.83 ^b ±0.07	1.61 ^a ±0.04	1.81 ^b ±0.09	1.61 ^a ±0.05	1.61 ^a ±0.06	1.56 ^a ±0.03	0.17 ^{**}
6 th	2.35 ^c ±0.09	2.17 ^{abc} ±0.08	2.28 ^{bc} ±0.07	2.12 ^{ab} ±0.10	2.11 ^{ab} ±0.06	2.08 ^{ab} ±0.05	1.97 ^a ±0.05	0.21 [*]
0 to 6 th	1.55 ^b ±0.04	1.48 ^{ab} ±0.03	1.45 ^{ab} ±0.03	1.46 ^{ab} ±0.05	1.41 ^a ±0.04	1.40 ^a ±0.04	1.36 ^a ±0.02	-

a,b,c,d Means bearing different superscripts in a row differ significantly (*P<0.05; **P<0.01)

Table 5. Effect of turmeric and amla (powder) on dressing percentage and meat bone ratio on live weight basis

Treat. / Parameter	Dressing percentage (%)	Meat bone ratio (%)
T ₀ Basal diet (Control group)	65.81 ^a ±1.38	13.35 ^a ±0.02
T ₁ Basal diet + turmeric powder @ 0.25%	67.55 ^{abc} ±0.18	14.19 ^b ±0.44
T ₂ Basal diet + turmeric powder @ 0.50%	68.02 ^{bc} ±0.10	14.35 ^b ±0.06
T ₃ Basal diet + amla powder @ 0.25%	68.93 ^c ±0.96	13.28 ^a ±0.06
T ₄ Basal diet + amla powder @ 0.50%	66.71 ^{bc} ±0.34	13.42 ^a ±0.02
T ₅ Basal diet + turmeric and Amla powder @ 0.25%	69.15 ^c ±0.13	14.29 ^b ±0.22
T ₆ Basal diet + turmeric and Amla powder @ 0.50%	72.20 ^d ±0.33	14.36 ^b ±0.06
Significance	2.22 ^{**}	0.64 [*]

a,b,c Means bearing different superscripts in a column differ significantly (*P<0.05; **P<0.01)

Table 6. Economics of broiler production:

Sr. No.	Particulars	T ₀	T ₁	T ₂	T ₃	T ₄	T ₅	T ₆
1.	Cost of day old chick (₹)	28.00	28.00	28.00	28.00	28.00	28.00	28.00
2.	Cost of feed (₹/kg)	27.00	27.00	27.00	27.00	27.00	27.00	27.00
3.	Cost of turmeric & amla (Powder) (₹/Kg of feed)	0.00	0.75	1.5	0.60	1.20	0.67	1.35
4.	Total cost of feed (₹/kg)	27.00	27.75	28.50	27.60	28.20	27.67	28.35
5.	Average total feed consumed per bird (kg)	4.215	4.180	4.175	4.190	4.194	4.200	4.175
6.	Cost of feed consumed per bird (₹) (4x5)	113.81	116.00	119.01	115.48	118.15	116.21	118.36
7.	Average body weight at the end of 6 th week (kg)	2.595	2.708	2.763	2.776	2.858	2.896	2.930
8.	Feed consumption per kg live weight gain (kg)	1.62	1.54	1.51	1.51	1.47	1.45	1.42
9.	Cost of feed per kg live weight gain (₹)	43.84	42.84	43.07	41.59	41.34	40.13	40.40
10.	Rearing cost (vaccines, water, electricity, labour charge, etc.) per bird (₹)	4.00	4.00	4.00	4.00	4.00	4.00	4.00
11.	Total cost of production (₹) (1+6+10)	145.81	148.00	151.01	147.48	150.15	148.21	150.36
12.	Average price realized @ ₹ 70 per kg live weight (₹)	181.71	189.55	193.40	194.34	200.09	202.71	205.10
13.	Net profit per bird (₹) (12-11)	35.91	41.55	42.40	46.86	49.93	54.51	54.74
14.	Cost benefit ratio	1.25	1.28	1.28	1.32	1.33	1.37	1.36

0.50% had higher growth rate, dressing percentage and net profit.

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