

EFFECT OF SUPPLEMENTATION OF DIFFERENT LEVELS OF DRIED TAMARIND PULP ON MEAT CHOLESTEROL, CARCASS YIELD, DRESSING PERCENTAGE AND ABDOMINAL FAT OF BROILER CHICKEN

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ABSTRACT

The present study was conducted to investigate the effect of supplementation of different levels of dried Tamarind pulp on meat cholesterol, carcass yield and dressing percentage of broiler chicken. 300 healthy day old commercial broiler chicks of 'Vencob' strain were selected and divided into five groups of 60 chicks in each group, three replicates of 20 birds in each group. The chicks of control group (Group I) were fed with standard broiler diet without dried Tamarind pulp, whereas dried Tamarind pulp was supplemented @250 gm, 500 gm, 1000 gm and 1500 gm per 100 kg of broiler ration respectively to groups -II, III, IV and V. The meat cholesterol was found to be significantly lower in treatment groups than in control group. However, carcass yield and dressing percentage of treatment groups were significantly higher than control Group. The carcass yield and dressing percentage were increased and meat cholesterol level was decreased on supplementation of dried Tamarind pulp in broiler rations.

KEY WORDS: Dried Tamarind pulp, Broiler chicken, Carcass yield, Dressing percentage, Meat Cholesterol

INTRODUCTION

The tamarind fruit contains about 55% pulp, 34% seeds and 11% shell (Kumar) and Bhattacharyya, 2008). Tamarind has been reported to have anti-diabetic (Gray and Flatt, 1999), anti-inflammatory and cholesterol lowering (Chithra and Leelamma, 1999), antifungal (Basilico and Basilica, 1999), antioxidant (Chithra and Leelamma, 1999) and antimicrobial properties (Deliquis *et al.*, 2002; Singh *et al.*, 2002). In addition, it has an appetizing and stimulatory effect on the digestive process (Cabuk *et al.*, 2003). Aengwanich *et al.* (2009) found that polyphenolic compound in the extracts could reduce heat stress in broiler chicken. With all these beneficial properties of tamarind, reports on its effects on poultry are limited. Hence this study was designed to assess the influence of feeding of tamarind pulp on meat cholesterol level, carcass yield, dressing percentage and abdominal fat of broiler chicken.

MATERIALS AND METHODS

For the present study, 300 healthy day old commercial broiler chicks of 'Vencob' strain were selected and divided into five groups of 60 chicks each. Each group was further sub-divided into 3 replicates of 20 birds in each. The experimental birds were reared in deep litter system with similar managemental practices for a period of six weeks .

The chicks in control group (Group I) were fed with standard broiler ration without dried Tamarind pulp, whereas the standard broiler ration was supplemented over and above with dried Tamarind pulp @ 250 gm, 500 gm, 1000 gm and 1500 gm per 100 kg of broiler ration respectively in groups - II, III, IV and V.

Table -1:Percent Ingredient and Chemical composition (%DMB) of Pre starter, Starter and Finisher broiler rations fed to five (I - control, II, III, IV & V) different experimental groups

Details	Broiler Pre Starter					Broiler Starter					Broiler Finisher				
	I	II	III	IV	V	I	II	III	IV	V	I	II	III	IV	V
	Ingredient composition (%) IA														
Maize	56.2	56.2	56.2	56.2	56.2	60	60	60	60	60	60	60	60	60	60
Rice (broken)	--	--	--	--	--	--	--	--	--	--	5.5	5.5	5.5	5.5	5.5
Soybean meal	34	34	34	34	34	26	26	26	26	26	18	18	18	18	18
Maize gluten 60	5	5	5	5	5	9	9	9	9	9	10.8	10.8	10.8	10.8	10.8
Vegetable oil	2	2	2	2	2	2.3	2.3	2.3	2.3	2.3	3	3	3	3	3
Common Salt	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
DL - Methionine	0.180	0.180	0.180	0.180	0.180	0.155	0.155	0.155	0.155	0.155	0.155	0.155	0.155	0.155	0.155
Di Calcium Phosphate	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.40	1.40	1.40	1.40	1.40
Lime Stone Powder	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Supplements*	0.250	0.250	0.250	0.250	0.250	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245	0.245
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Dried Tamarind Pulp	0	0.25	0.5	1	1.5	00	0.25	0.5	1	1.5	00	0.25	0.5	1	1.5
Chemical composition (%DMB) IB															
DM	91.4	90.60	91.4	92.50	91.80	92.4	92.60	92.4	92.00	92.00	91.98	90.42	92.02	91.64	89.9
CP	23.3	22.86	23.45	23.18	22.80	22.86	21.3	21.45	22.18	24.80	21.21	20.89	21.06	21.18	20.08
EE	3.17	2.60	2.40	2.60	2.80	5.17	5.49	5.29	5.60	5.80	6.32	6.28	6.07	6.85	6.25
CF	3.26	4.89	4.49	3.29	4.41	3.26	2.90	2.90	4.41	4.89	3.18	3.33	3.24	3.89	4.18
TA	6.33	6.11	6.93	7.26	7.49	6.33	6.11	6.26	6.93	6.49	6.04	6.96	6.83	6.85	7.98
Ca	1.29	0.9	1.00	1.40	1.00	1.29	0.9	1.00	1.40	1.00	1.38	0.98	1.17	1.17	1.35
P	0.58	0.33	0.41	0.52	0.41	0.58	0.33	0.41	0.52	0.41	0.57	0.71	0.56	0.61	0.47
NFE	63.94	63.54	62.73	63.67	62.5	62.38	64.2	70.76	67.81	58.02	72.75	72.15	66.04	61.23	61.51
ME (Kcal/kg)**	2978.10	2987.53	2996.95	3015.8	3034.65	3095.9	3105.33	3114.75	3133.6	3152.45	3186.2	3195.63	3205.05	3223.90	3242.75

*Vitamins supplement and feed additives, ** Calculated values

The ingredient composition (%) and chemical composition (% DMB) of pre starter and finisher broiler rations fed to five (I-control, II, III, IV & V) different experimental groups analysed as for method of AOAC (2004) are given in Table-1.

Evaluation of meat cholesterol

Six Broilers were slaughtered randomly among each replicates of different treatments at the end of 6th week. The muscle samples were collected, chopped, minced and frozen at -20°C for the analysis of total cholesterol. The meat samples were chopped and minced with mortar and pestle. The total lipid was extracted from the muscle samples as per the method of Folchet *al.* (1957) and the total meat cholesterol was estimated by Automatic Biochemical Analyzer '3000 revolution' made by Tulip's Diagnostic Pvt. Ltd., Mumbai.

Carcass yield and dressing percentage

At the end of the experiment all the remaining birds from respective group were used for carcass evaluation studies. The birds were fasted for a period of three hours prior to slaughter.

The live weights of the birds were recorded before slaughter. For obtaining edible carcass yield, the carcass was weighed after removal of feathers, viscera, head and legs. Heart without pericardium, liver without gall bladder, empty gizzard and abdominal fat were weighed individually and average weights of these organs were recorded for the respective groups. Dressing percentage of experimental birds of all groups were determined at the end of experiment, as under.

Dressing % = (Carcass yield / Live weight) \times 100

Abdominal Fat

The weight of the fat present in abdomen including fat surrounding gizzard, bursa, cloaca and adjacent muscles of each bird was recovered and expressed as g/bird in terms of live weight.

All the results were analyzed statistically by analysis of variance to determine the means and standard error as per the methods described by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The mean values of carcass yield, dressing percentage, abdominal fat and meat cholesterol observed in different treatment groups at the end of study (42nd day) are shown in Table-2.

Table 2: Carcass yield, dressing Percentage, abdominal fat and meat cholesterol of experimental Boilers

Parameter	Treatment groups (Mean \pm S.E)				
	T ₀ (Control)	T ₁	T ₂	T ₃	T ₄
Carcass yield (g)	1351.81 ^a \pm 31.74	1730.16 ^b \pm 54.38	1613.20 ^a \pm 37.66	1635.34 ^a \pm 41.51	1631.89 ^a \pm 28.98
Dressing percentage	65.23 ^b \pm 0.88	73.12 ^a \pm 0.53	72.35 ^a \pm 0.63	71.79 ^a \pm 0.97	71.42 ^a \pm 0.99
Abdominal fat (gm)	81.06 \pm 1.42	34.48 \pm 4.73	40.09 \pm 3.91	41.33 \pm 2.85	40.36 \pm 1.76
Meat Cholesterol (mg/100gm)	3.88 ^a \pm 0.10	2.20 ^d \pm 0.10	2.56 ^c \pm 0.10	3.23 ^b \pm 0.14	2.74 ^c \pm 0.13

Means with different superscripts in a column differ significantly.

Statistical application revealed highly significant variation in carcass yield among five groups. Highest carcass yield was observed in treatment Group T_1 (1730.16 ± 54.38) followed by T_3 (1635.34 ± 41.51), T_4 (1631.89 ± 28.98), T_2 (1613.20 ± 37.66), and lowest in control Group T_0 (1351.81 ± 31.74). Saleh *et al.* (2012) observed non significant ($P < 0.05$) difference for carcass yield of broiler chickens on supplementation of aqueous solution of 30 g/L Tamarind pulp.

No significant variation was observed in dressing percentage among treatment groups. However, dressing percent of treatment groups was significantly higher than control Group. Saleh *et al.* (2012) observed non significant ($P < 0.05$) difference for dressing percent of broiler chickens on supplementation of aqueous solution of 30 g/L Tamarind pulp.

Higher abdominal fat content was recorded in control Group T_0 (81.06 ± 1.42) as compared to treatment Groups T_1 (34.48 ± 4.73), T_2 (40.09 ± 3.91), T_3 (41.33 ± 2.85) and T_4 (40.36 ± 1.76).

Significantly lower ($P \leq 0.05$) meat cholesterol levels were recorded in T_1 followed by T_2 , T_4 , and T_3 as compared to T_0 . Similar findings were reported by Ursula *et al.* (2013) indicating hypolipidemic property of DTPP.

Significant improvement in carcass yield and dressing percentage and reduction in abdominal fat and meat cholesterol in broiler chicken after supplementation of dried Tamarind pulp in broiler ration.

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