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Effects of Dietary Thyme Leaf on Broiler Growth Performances, Carcass Characteristics and Cooking Yield of the Meat.

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ABSTRACT

The present study was conducted to investigate the effects of dietary thyme leaf on broiler growth performance, carcass characteristics and cooking yield of the meat. Eighty day-old mixed sex broiler chicks used in this study were fed commercial diet for four weeks before being randomly assigned to four treatments of two replicates with ten birds per replicate and fed experimental diets for four weeks before slaughtering. Results showed that dietary thyme leaf exert no significant effect ($P>0.05$) on the growth performance, weights of primal parts and internal offals of broilers. No significant difference ($P>0.05$) was observed on the cooking yield and cooking loss of the tested broiler meat. This result suggests that thyme leaf is not a growth promoter. However it did not exert any deleterious effect on the tested animals.

Keywords: *Thyme leaf, growth performance, carcass characteristics, cooking yield.*

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INTRODUCTION

Modern intensive poultry production has achieved phenomenal gains in the efficient and economical production of high quality and safe chicken meat, eggs and poultry byproducts. At the same time as making gains in production and efficiency, the industry has had to maximise the health and well-being of the birds and minimise the impact of the industry on the environment. The use of feed additives has been an important part of achieving this success. The diet of animals and humans contain a wide variety of additives. However, in poultry diets these additives are primarily included to improve the efficiency of the bird's growth and/or laying capacity, prevent disease and improve feed utilization Poultry CRC, (2013)

Common feed additives used in poultry diets include antimicrobials, antioxidants, emulsifiers, binders, pH control agents and enzymes. Sometimes diets will also contain other additives used in diets for humans and pets such as flavour enhancers, artificial and nutritive sweeteners, colours, and lubricants. The importance of additive especially of plant origin has greatly increased in recent years. (Chidamabaramurth, 2002). Recently, herbs, spices and various plant extracts have received increased attention as possible antimicrobial growth promoter replacements (Hernandez, 2004). Various plant extracts and their bioactive components possess broad antimicrobial activities (Cross, 2003; Lewis, 2003).

In Nigeria and some other parts of the world, leaves of thyme or its powdered herbs are used as spices to add flavour to meats and vegetables. Thyme (*Thymus vulgaris*) has been reported to possess strong antioxidants properties (Schwar, 1996, Lacroix, 1997). Onibi (2003) reported anti-oxidative activity of added dried leaves of thymes to ground fresh and cooked broiler chicken meat during refrigerated storage. Thyme in its crude herb form is carminative, antibiotic, anthelmintic, astringent expectorant and antitussive (Leung and Foster, 1996). However little or no information is available on the effect of

dietary thyme leaves on growth performance and cooking yield of broiler meat. This research work therefore assessed the effect of dietary thyme leaves on growth performance, carcass characteristics and cooking yield of broiler meat.

Materials And Methods.

Eighty day old mixed sex broiler chicks were used in this study. The birds were fed with starter diet (Animal Care Feed) for five weeks after which the birds were randomly allotted to 4 treatments of two replicates with ten (10) birds per replicate and fed experimental diet containing varying levels of thyme leaf meal for four weeks before slaughtering.

Thyme (ducrose thyme by Ducros International Limited, Onisha Nigeria, Reg Trade Mark No T.P 15609) was purchased from Baboko market in Ilorin, Kwara state, Nigeria. This was milled before incorporation in the broiler feed purchased. The inclusion levels were 0g/kg; 10g/kg, 20g/kg or 30g/kg feed.

The commercial starter diet (Feed master) used contained 23.0%, 4.5%, 4.0% and 2800kcal/kg crude protein, crude fat, crude fibre and energy respectively while the basal finisher diet contained 20.0% 3.5% 8.0% and 2800kcal/kg crude protein, crude fat crude fiber and energy respectively (as contained in the bag label).

Experimental diets and water were supplied *ad libitum* for a period of four (4) weeks. Weight gain was recorded on weekly basis during the four weeks trial.

Six birds from each treatment (a total of 24 birds) were taken weighed and then slaughtered by cutting the jugular vein. The birds were given equal time of bleeding (30 minutes) then scalded in hot water of about 80°C for 30 seconds before they were manually defeathered. The carcasses were then eviscerated and cut into primal parts (breast, thigh, drumstick, back and wing) and the weight of each dressed carcass, primal parts and internal edible offals were taken. The drumsticks and thigh were first weighed, and then cooked with the microwave oven for 16 minutes. The cooked parts were cooled to room temperature before they were re-weighed to determine the cooking yields and cooking losses. Cooking yield and cooking loss were calculated as follows:

$$\text{Cooking yield} = \frac{W_y}{W_x} \times \frac{100}{1}$$

$$\text{Cooking loss} = \frac{W_x - W_y}{W_x} \times \frac{100}{1}$$

Where

W_x = Weight of fresh meat before cooking

W_y = Weight of meat after cooking.

The retail or primal cuts were weighed using the triple beam balance and expressed as a percentage of the dressed carcass weight.

Statistical Analysis

Data collected on growth performance, primal parts weight, offals weight, cooking yield and cooking loss were subjected to one way analysis of variance (ANOVA) of a Complete Randomised Design (Steel and Torrie, 1980) using version 11 of the statistical package of IBMPC (SPSS/PC+).

RESULTS AND DISCUSSION

Table 1. Effects of dietary thyme leaf meal on growth performance of broiler chicks. Levels of Thyme Leaf Inclusion (g/kg)

Parameters	0	10	20	30	±SEM
Av. initial wt (kg)	0.62	0.59	0.61	0.61	0.006 NS
Av. final weight(kg)	1.93	1.90	2.08	2.03	0.038NS
Av. weight gain (kg)	1.31	1.31	1.47	1.42	0.032 NS
Daily weight gain (g)	46.79	46.79	52.50	50.71	1.425 NS

NS: Not significant (P > 0.05)

Total weight gain and daily weight gain of broiler chicks fed thyme leaf included diet were not significantly different (P>0.05) from birds fed the control diet. (Table 4.2). This showed that the inclusion of thyme leaf in broiler diets did not significantly affect (P>0.05) growth performance of the birds. It therefore suggests that thyme leaf is not a growth promoter.

Table 2. Effects of dietary levels of thyme leaf meal on carcass characteristics of broiler chicken (g/100g carcass weight). Levels of Thyme leaf inclusion (g/kg)

Parameters	0	10	20	30	±SEM
Liveshrunk Weight (kg)	2.05 ^{ab}	2.00 ^{ab}	2.08 ^b	1.76 ^a	0.04 *
Dressed Carcass weight (%)	71.71	74.00	71.45	72.16	0.40 NS
Breast weight	22.57	21.25	22.47	23.47	0.41 NS
Thigh weight	16.67	16.54	16.47	17.12	0.23 NS
Drumstick weight	15.08	14.27	15.12	14.89	0.27 NS
Back weight	17.37	17.73	17.83	19.42	0.48 NS
Wing weight	19.22	17.92	18.37	18.97	0.31 NS

a,b,Treatment means within rows having different superscripts differ significantly (P<0.05).NS – Not Significant (P>0.05) *Significantly different (P<0.05).

Liveshrunk weight was observed to be higher in birds fed 20g/kg thyme leaf diet (Table 4.2). However, the weight was not different (P>0.05) from the control diet. It was observed that inclusion of thyme leaf in the broiler diet did not have significant effect (P>0.05) on dressed carcass percentage and weights of primal parts (Breast, thigh, Drumstick, back and wing) These result are in conformity with that of Dapkevicius (2002) who reported that aromatic and medicinal herbs are not source of growth promoters. Coetzee et al. (2001) reported that there was no significant difference (P>0.05) in the weight gain of broiler chicks fed different levels of dietary alpha tocopherol supplementation as an antioxidant. However, meat peroxidation was reduced with increasing levels of tocopherol supplementation.

Table 3. Effects of graded levels of dietary thyme leaf meal on the relative weight of broiler chicken offals(g/100g body weight). Levels Of

Parameters	Thyme Leaf Inclusion(g/kg)				±SEM
	0	10	20	30	
Heart	0.59 ^a	0.63 ^a	0.76 ^{ab}	0.85 ^b	0.028*
Lung	0.78	0.67	0.79	0.78	0.030 NS
Gizzard	3.77 ^a	2.91 ^a	3.23 ^a	5.41 ^b	0.361*
Liver	2.66	2.49	2.93	2.72	0.088 NS
Head	3.94	4.50	4.50	4.06	0.097 NS
Shank	5.85	6.46	6.69	6.25	0.162 NS

a,b,Mean value in the same row with different superscripts differs significantly (P<0.05) N S – Not significant (P>0.05) *Significantly different (P<0.05)

Heart weight and gizzard weight were observed to be higher (P<0.05) in birds fed 30g/kg thyme leaf diet (Table 4.4). However, there was no significant difference (P>0.05) in the birds’ liver weights, lung weights and the weights of external offals. This suggests that thyme inclusion in broiler diet is not deleterious.

Table 4. Effects of dietary thyme leaf meal on the cooking yield and cooking loss of broiler chicken meat (%). Parameters. Levels of Thyme Leaf Inclusion(g/kg)

	Leaf Inclusion(g/kg)				±SEM
	0	10	20	30	
Cooking yield					
Thigh	71.05	71.08	70.47	70.17	1.994 NS
Drumstick	70.41	70.16	72.63	74.02	1.590 NS
Cooking Loss					
Thigh	29.11	28.92	29.53	29.86	1.171 NS
Drumstick	29.59	29.84	27.37	25.98	1.589 NS

NS – Not significant (P>0.05)

Cooking yield was observed to be higher in drumstick of broiler fed 30g/kg thyme leaf meal diet when compared with other levels however, the difference was not significant (P>0.05). Thyme leaf inclusion in broiler diet had no significant effect (P>0.05) on cooking yield and cooking loss of broiler meat. (Table 4.5) This result of cooking yield is similar to that of Fayeye (1994) who reported that cooking yield increased with the level of mango seed kernel meal in rabbit diets however ,it was not statistically (P.0.05) significant.

CONCLUSIONS

Thyme leaf is not a growth promoter. It had no effect (P>0.05) on weights of primal parts and internal offals of broiler. Cooking yield and cooking loss of broiler meat were not influenced by inclusion of thyme leaf in broiler diet.

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