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The Effect of Feeding Rosella (Hibiscus Sabdariffa) Seed on Broiler Chick's Performance

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Abstract: The effect of feeding rosella (Hibiscus sabdariffa) seed on broiler chicks at dietary levels up to 22.5% were studied over a6 weeks period.Day old unsexed commercial broiler chicks (Hypro) were used...Four experimental diets containing graded levels of rosella seed (0.0,7.5,15.0 and 22.5) using maize,groundnut and sesame meal were formulated.Chicks were randomly distributed into four groups of 30 chicks each in completely randomized design.Each group was further subdivided into (3) replicates of 10 birds.Feed intake,body weight and body weight gain were recorded weekly. Results obtained showed a decrease in feed intake weight gain and feed conversion with the increase of Roselle seed in the diets and no effect on the mortality rate of chick.

Key words:

INTRODUCTION

Broilers are the most efficient in converting raw feed stuffs and by-products into high protein food which is urgently needed to improve the nutritional standards of the human.From the economical view as a means of reducing production cost, the country is planning to stop the importation of protein concentrate and to utilize the local agro- industrial by- products. Rosella (Hibiscus sabdariffa) seed is one of these by-productions. In the Sudan rosella seeds are used as a seasoning in the same way as (Hibiscus cannibinus) seeds. The seeds have a bitter taste and contain 13.5 and 18.5% a brownish-yellow oil with sweetish,sickly odor[4]. The residual cake can be used in animal feeding[6].

Rosella seed oils reported to contain unusual fatty acids namely epoxy-oleic and cyclopropenoid fatty acids,which are found in seed lipids of the order Malvales, that comprise several important sources of food for man and animals,[3]. The occurrence of these unusual fatty acids in rosella seed oil showed variations with the stage of seeds maturity.Gossypol,the phenolic compound which known to cause undesirable physiological effects on non ruminants,such as poultry[9] was found in roselle seed only as traces.

MATERIAL AND METHODS

120 one day- old unsexed (hypro) chicks were randomly divided into 4 groups of 30 chicks; each group was further subdivided into 3 replicates with 10 chicks per each. Four experimental diets were formulated to evaluate the nutritive value of rosella (karkadeh) seed for broiler chicks as source of protein. Table (1) showed composition, calculated and determined composition of diets. Diet (1) was the basal one to which graded levels of rosella seed were added (0.0, 7.5and 22.5%).The variation in energy concentration were supplemented with vegetable oil where required. Diets were also supplemented with lysine or methionine or both where necessary. Birds average body weight and feed intake was taken weekly where mortality was recorded daily.

Table 1: The ingredients of the experimental diets used

	Roselle seed inclusion %			
	0.0	7.5	15.0	22.5
Maize	61.0	58.0	51.545	46.19
Groundnut cake	16.0	13.0	13.0.	12.0
Sesame cake	16.0	14.9	14.2	13.135
Supper conc.	5.0	5.0	5.0	5.0
Oyster shell	0.5	0.5	0.5	0.5
Salt	0.5	0.5	0.5	0.5
Roselle seed	0.0	7.5	7.5	22.5
DL-Meth. 98%	0.0	0.02	.02	0.05
L- Lysine99%	0.36	0.41	0.235	0.165
Vegetable oil	0.64	0.17	0.0	0.0
Calculated composition (%) of diets used				
ME	3009.5	3007.87	3011.95	3031.2
Crude protein	21.64	21.086	21.81	21.998
Lysine	1.1	1.1	1.1	1.1
Methionine	0.54	0.54	0.54	0.54
Calcium	1.13	1.13	1.15	1.15
Phosphorous	0.71	.0.71	0.72	0.74
Chemical composition of experimental diets*				
Calcium	1.3	2.0	2.01	2.2
Ash	10.5	9.6	9.9	8.4
Crude protein	21.15	21.05	21.55	21.56
Ether extract	5.2	6.8	7.5	7.6

*Analysis values are means of duplicate samples assayed.

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At the end of the experiment period two birds (male and female) from each replicate were selected at random, weighed individually, slaughtered and internal organs were dissected out then the liver; pancreas and abdominal fat pad were excised and weighed. The collected data was subjected to analysis of variance and the regression analysis[10].

RESULTS AND DISCUSSIONS

Table (2) showed the proximate composition of rosella seed. Data obtained showed a negative response of dietary feeding graded levels of rosella seed. The regression analysis of variance showed that feed intake, feed conversion, body weight and live body weight gain decreased as the level of rosella seed increased (y=a+bx). Table (3) showed the performance of chicks.For the internal organs results showed that the level of rosella seed in diets had no significant effect on liver; pancreas and abdominal fat relative weights.

Table 2: Chemical composition of Rosella seed

Moisture %	8.20
Dry matter %	91.80
Ether extract %	17.43
Crude protein %	21.35
Crude fibre %	11.98
Ash %	5.34
Calcium mg/100 gDM	388.00
Phosphorus mg/100 gDM	503.00
Metabolizable energy Mj/kg	12.04

Table 3: The effect of feeding graded levels of Roselle seed on performance of broiler chicks.

	Roselle seed inclusion %				
Ingredients	0.0	7.5	15.0	22.5	SEM+
Initial body weight(g/bird) *	39.5	39.8	39.5	39.7	$0.83^{N.S}$
Final body weight (g/bird) *	1396.4^{a}	1139.8^{b}	874.8^{c}	898.8^{c}	$24.99^{H.S.}$
Av. body wt.gain (g/bird)	1356.9^{a}	1999.9^{b}	835.3^{c}	859.1^{c}	$25.02^{H.S.}$
Av. Feed intake (g/bird) *	2495.75^{a}	2167.52^{a}		2362.31^{b}	2246.24 $^{b}124.78_{N.S.}$
Feed conversion (g feed/g wt.) *	1.8^{a}	1.97^{ab}	2.7^{b}	2.6^{c}	$0.15^{H.S.}$
Liver weight %**	2.22	2.3	2.4	2.7	$2.55^{N.S}$
Pancreas weight%**	0.16	0.18	0.24	0.33	$0.31^{N.S}$
Abdominal fat weight%**	1.21	1.20	1.62	1.28	$6.0^{N.S}$

*Values are means for three replicates of chicks each
**Values are means of 8 chicks / treatment
$^{N.S}$ not significant (P>0.05).
$^{H.S.}$ Highly significant (P<0.05).
Means in the same raw different subscript are different (P>0.05).

Discussion: The results obtained showed the poor performance of tested chicks. These results were in agreement with the findings of Mohammed and Idris[8] and Ahmed[1]. Babatunde *et al.*[2] also suggested that feeding of broiler chicks performance. The acid taste of rosella seed and sickly odour may also play arole in lowering the intake of roselle seed diets[4].

Data collected showed that feed conversion ratio, decreased with increasing levels of rosella seed in diets and with increasing age of chicks These findings were in agreement with results obtained by Kelly and Potter[7]. On contrary,live weight gain increases with increasing of age of chicks and decreases with the the increase of levels of rosella seed.The unusual fatty acids namely expoxy-oleic and cyclopropenoid fatty acids and the phenolic compound in rosella seed caused insignificant reduction in relative weight of the livers and an increase in weights of pancreas. These results were inline with the findings of Bakheit[3].

As a conclusion rosella seed can be a substitute of vegetable proteins up to 7.5%without any adverse effects on chick growth.

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