Utilization of Roselle *(Hibiscus Subdariffa)* seed meal in diets for Growing broiler chickens.

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SUMMARY

The nutritive value of Roselle Seed meal (RSM) as a feed ingredient for broiler chicks was studied. Sesame and groundnut cakes in a sorghum grain based diet were replaced by 0, 100, 200 and 300 g/kg RSM in the concentrate compound, and fed to Hybro commercial broiler chicks for 6 weeks.

The results indicated that RSM can replace both sesame and groundnut cakes in diets for growing broilers. There is a linear relationship between the dietary level of RSM and body weight gain, food intake and feed conversion ratio.

RSM less than 20% significantly depressed body weight gain and feed conversion ratio while 20 and 30% levels produced insignificant differences in body weight gain, food intake, feed conversion ratio and mortality rate.

The 17.84% crude fibre level in RSM' produced no observable deleterious effect in the perfotmance•of the experimental birds.

INTRODUCTION

The rising costs of the protein rich feeds in the Sudan has encouraged search for protein sources to formulate adequate and practical dietary rations based on low costs.

The use of Roselle (Locally known as Karkadi) seed meal for feeding broilers as a protein and energy source has not been extensively investigated in the Sudan. The seeds are processed for the manufacture of edible oil with the resultant RSM as a by-product characterized by high content of crude protein.

Recently (Irdis 1985) tried RSM as supplement to broiler diets containing soyabean and groundnut cakes. He demonstrated that although crude protein level in RSM is adequate the high crude fibre and the poor quality of the protein may limit it's rate of inclusion in broiler sorghum grain based diets. The purpose of the present study was to assess the performance of commercial type broiler chickens when groundnut and sesame cakes in a broiler diet were replaced by varying levels of RSM.

MATERIALS AND METHODS

The experiment was conducted in Kuku Poultry Research Station in Khartoum North. The crude protein sources used in the present work were Roselle seed meal, sesame and groundnut cakes; obtained from local oil mills. The proximate analysis of these feeds is given in table (1).

The experiment included four broiler concentrate compounds formulated to meet the NRC (1971). The concentrate compounds contained four levels of RMS and protein source i.e. 0.0 g, 100 g, 200g and 300g/kg of the concentrate compound.

Table 1 Chemical Composition of RSM in comparison to sesame and groundnut meals g/kg as fed.

Nutrient	RSM	Sesame	Groundnut
D.M	948.9	965	950
C.P.	351.2	397.7	430.1
C.F	178.3	91.7	92.5
E.E	51.0	122.2	71.6
Ash	107.3	144.5	89.0
ME MJ/kg	11.48	11.7	11.57
Lysine	12.5	10.72	15.5
Methione	2.6	12.0	5.2

Note: Amino acid contents of RMS are those of Idris (1985). Amino acid contents of sesame and groundnut cakes were taken from feeding stuffs (Ceres, 1971).

The ingredients, the chemical analysis and energy values of the compounds are given in Table 2. The RMS free compound is considered as a control diet.

Table 2 The Composition of the experimental diets (g/kg) as fed.

Ingredent	OORSM	100RSM	200RSM	300RSM
Sorghum	598	670	540	442
Seca rre cake	200			
Groundnut cake	144	-		
RSM		100	200	300
Wheat bran	-	130	160	150
Super concent-rate 5%*	50	70	50	50
Vegetable oil		70	50	50
Oyster shell	8	10	10	8
Total	1000	1000	1000	1000
Calculated analysis				
ME (Mi/Kg)	13.6	14.3	13.6	14.1
C.P. g/kg	258.4	248.0	253.9	241.8
C.F. g/kg	47.0	43.0	41.0	35.0
Lysine g/kg	10.1	10.2	11.0	11.0
Methionine g/kg	5.2	4.7	4.7	5.5
Methionine + cystene g/kg	9.8	9.0	9.0	10.0

*** Super concentrate (hendrix) supplied 9.205 MI ME, 40% C.P., 8.75% Lysine, 1.6 % Methionine, 2.0% (Methionine + Cystene,) 7.6% Ca and 4.8% P.**

Contents of ingredents other than amino acids were those given in Nutritional Composion of Sudanese Animal. Feed, bulletin No. 1 (1981).

Hundred twenty commercial, locally hatched broiler chicks were used in this experiment. The chicks were divided into four groups of thirty chicks each arranged in three replicates of ten chicks each. Each replicate was housed in conventional brooders (4.5x2.8x2.5m) with wood shaving litter. The brooder houses were supplied with continous light.

The broiler groups were assigned at random to one of the four concentrate compounds in a continous feeding trial for fourty two days. Throughout the experimental period feed and water were freely available.

Feed intake and changes in liveweight of chicks weres recorded at weekly intervals. At the end of the experimental period, three birds from each replicate were sacrifieed and hot carcass weight determined and dressing percentage claculated.

The data were subjected to statisitcal analysis by determining group means and the standard error of the mean with significant differences determined by student "t" test according to Snedecor and Cochran (1980).

RESULTS AND DISCUSSION

The results provided evidence that RSM can replace groundnut and sesame meals without significantly reducing weight gain, feed intake, feed conversion ration, (FCR), mortality and dressing percent. There was a linear relationship within the RMS levels (100, 200, 300) and body weight gain, food intake and FCR. Mean liveweight gain tended to increase as RSM content of the diet was increased.

Table (3) Performance of broiler chicks.

Parameter	D1 0 RSM	132 100 RSM	D3 200 RSM	D4 30030 RSM
Number of chicks	3		30	
Initital weight	93±2.91	92±4.54	87±5.46	87±4.15
Final weight	1373+44.18	1204+22.94	1321F57.74	1370+98.50
Livewight gain (g)	1281+43.33	1112+11.20	1236+60.42	1284+106.46
Food intake (g.	3511±78.12	3410±15.84	3570±70.33	3584±126.46
FCR (kg feed/wt. gin)	2.74±0.04	3.07±0.03	2.88±0.02	2.7Skt0.13
ortality %	6.6	3.3	9	3.3
Dressing %	70.821-3.53	74.39±3.43	70.22±.6 2.82	73.61±5.47

Values are means ± SD

Table (4) Body weight and organ proportion of broiler chickens

	D1	D2	D3	D4
Bodyweight (g	1270±79.12	1183 ± 39.00	1266 ± 39.00	1330 + 80.43
Starv)				
Dressing %	70.82±3.53	74.39±3.43	70.22±2.82	73.61 + 5.47
Head and shanks	8.03 ± 0.77	7.86 ± 0.48	7.50 ± 0.59	7.08 ± 0.65
Heart %	0.32 ± 0.00	0. 25 ± 0.00	0.24±0.00	030 ± 00
Liver	1.65 ± 0.14	1.86 ± 0.09	1.38 ± 0.17	1.73 ± 0.17
Gizard	2.04 ± 0.16	2.28 ± 0.17	2.45 ± 0.15	2.26 ± 0.17
Total Viscera	12.44 ± 0.37	10.82±031	11.37 + 1.8	11.28 ± 0.57

Values are. means ± SD.

The performance of chicks recieving the RSM were not significantly different from the control group. These results contradicted those of Idris (1985) who demonstrated poor performance of broiler chicks when soyabean and groundnut meals were totally substituted by 27% RSM. The depressed feed intake pattern which might be associated with acid taste of RSM reported by Idris (1985) was not observed in this study. On the contrary the better performance of the experimental birds in this study is directly related to the amount of food consumed.

It was concluded that although RSM contains high crude fibre (178.3 g/kg), satisfactory weight gain with a high efficiency of food utilization were obtained with diets 2, 3 and 4 which indicated that the quality of protein in RSM within these ranges was satisfactory and safe for broiler production.

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