

**NSAP****47th Annual
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(JOS 2022)****CONFERENCE
PROCEEDINGS**THEME
**SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES**

HEMATOLOGICAL INDICES OF BROILER CHICKENS FED DIETARY LEVELS OF KAURA SORGHUM AS REPLACEMENT FOR MAIZE WITH FULL FAT SOYA BEAN

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ABSTRACT

Two hundred and fifty dayold broiler chicks were used to determine the effect of feeding Kaura sorghumbased diets with full fat soya bean on the hematological and serum characteristics of the birds. Five diets each of 23% CP starter and 20% CP finisher were formulated. The birds were randomly allotted to the five dietary treatments in four replicates in a completely randomized design. Blood samples were collected through the wing vein with syringe and needle from 2 randomly selected birds in each replicate into sample bottles. The samples were analyzed to obtain hematological and serum biochemical parameters. The results showed no significant difference in all the hematological parameters and the values were within range. Similarly, all the serum biochemistry parameters indicated no significance except on calcium ($P < 0.01$) with highest and lowest values of 2.15 and 1.93 in diets 1 and 5 respectively. Kaura sorghum variety can completely replace maize in broiler diets without affecting their health status and is recommended for use up to 100%.

Key words: Kaura sorghum, broiler birds, hematology, serum biochemistry

INTRODUCTION

The haematological and serum biochemical parameters of the avian are influenced by nutrition (Swenson, 1993). Therefore, nutritional anaemia in lower animals is due to a reduction in red blood cell (RBC) production. Generally, poor quality of feed especially inadequate protein and energy intake or malnutrition lower the PCV and Hb concentration which are the major indicators of anaemia. (Swenson, 1993) reported that low blood glucose confirms inadequate energy intake and low blood albumen indicates low protein intake. It has also been identified that fast growing animals have high serum albumin, globulin and glucose and low concentration of potassium (Swenson, 1970). However, it was also reported that, there is rather low correlation between blood glucose and energy consumption and that plasma free acids are most highly related to energy consumption (Scott, 1970). Therefore, high – energy diets, when fed to broilers increase their performance within a very short time. More so, the content of energy in their diets has some adverse effects on the health status of the birds. The objective of this research was to ascertain the health status of birds fed Kaura sorghum variety based diets with full fat soya bean by evaluating their hematological and serum biochemical parameters and also the safety of the carcass for human consumption.

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MATERIALS AND METHODS

The research was carried out at Collage of Education Azare, Bauchi state, Nigeria. Five independent diets of 23% CP starter and 20% CP finisher diets were formulated for the experiment. Two hundred and fifty (250) already brooded broiler chicks were randomly allotted to the five dietary treatments in four replicates with 12 birds per replicate in a completely randomized design. Feed and water were supplied to the bird *ad libitum* for 8 weeks in deep litter system. All vaccinations schedules were carried out at their appropriate times. At the end of the 8 weeks period blood samples were collected from 2 randomly selected birds from each replicate via the wing veins using needles and syringes in to leveled containers with EDTA to avoid coagulation. The sample was taken to the hematology laboratory at ATBU Bauchi for analysis. Results obtained were subjected to analysis of variance as described by Steel and Torrie and means with significant differences were separated using Duncan multiple range test.

RESULTS AND DISCUSSIONS

The results obtained after the analysis indicated that there is no significant differences among the hematological parameters observed in this research, however, they all fall within the recommended ranges. The values found in HB, PCV, TWBC and RBC were 7.78-10.25, 23.50-30.00, 227.07-265.50 and 2.19-2.73 respectively (Kwari *et al.*, 2014). Similarly, there were no significant differences among all the serum biochemistry parameters studied in this research except in calcium ($P < 0.01$) with values ranging from 1.93 to 2.15 mMol/l. They are also within the recommended ranges as reported by Kwari *et al.* (2014). This suggest that the birds were in good health status which agree with the reports of Kwari *et al.* (2014) on birds fed different cerealbased diets. It further suggests that Kaura sorghum variety is safe for feeding broiler chickens.

CONCLUSION AND RECOMMENDATION

It was concluded that Kaura sorghum variety can completely replace the highly competed maize in broiler diets without negative effects on the blood parameters and health status of the birds which suggest that Kaura sorghum is safe for use as energy aZsource in broiler diets and is recommended for use up to 100%.

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Ingredients	Diets				
	1	2	3	4	5
Starter	(0%)	(25%)	(50%)	(75%)	(100%)
Maize	47.80	33.85	23.90	11.95	00.00
Kaura Sorghum	00.00	11.95	23.90	33.85	47.80
Soya bean	33.30	33.30	33.30	33.30	33.30
Wheat offal	10.00	10.00	10.00	10.00	10.00
Additives	8.90	8.90	8.90	8.90	8.90
Total	100	100	100	100	100
Crude protein (%)	23	23	23	23	23
Met. Energy (Kcal/kg)	3069.40	3050.60	3037.80	3021.70	3006.30
Finisher					
Maize	52.88	13.22	26.44	39.66	00.00
Kaura Sorghum	00.00	39.65	26.43	13.21	52.88
Soya bean	23.23	23.23	23.23	23.23	23.23
Wheat offal	15.00	15.00	15.00	15.00	15.00
Additives	8.90	8.90	8.90	8.90	8.90
Total	100	100	100	100	100
Crude protein (%)	20.00	20.00	20.00	20.00	20.00
Met. Energy (Kcal/kg)	3026.93	3009.15	2992.03	2074.25	2991.45

Table 3: Hematological Indices of Broiler Chickens Fed different levels of Kaura Sorghum Diets replacing maize with full-fat Soya Bean

Parameters	Normal range	Diets					SEM
		1	2	3	4	5	
		(0%)	(25%)	(50%)	(75%)	(100%)	
HB (g/dl)	9.00-10.20	9.88	7.78	9.43	10.25	9.63	0.69 ^{NS}
PCV (%)	35-55%	29.75	23.50	28.00	30.00	28.75	2.14 ^{NS}
TwB (ul)	>5000	241.90	227.07	256.25	24.78	2.6550	11.16 ^{NS}
RBC (ul)	2.5-4.5	2.45	2.19	2.73	2.51	2.66	0.18 ^{NS}
PLT (%)	10.00-30.00	11.50	17.00	29.00	7.75	10.75	5.79 ^{NS}
NEUT (%)		5.20	5.20	5.83	5.80	3.98	0.75 ^{NS}
LYMP (%)	20-50%	91.20	90.65	91.58	91.63	94.78	0.19 ^{NS}
MONO (%)	0-3%	2.43	2.75	2.13	2.38	1.10	0.55 ^{NS}
EOSI (%)	0-2%	0.63	0.35	0.48	0.18	0.15	0.17 ^{NS}

NS = Not significant, SEM = Standard Error of the Mean, PCV = Packed Cell Volume, Hb = Haemoglobin Concentration,

TWB = Total White Blood, RBC = Red Blood Cell,

PLT = Platelet, NEUT = Neutrophyl, LYMP = Lymphocytes



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Table 4: Serum Biochemical Indices of Broiler Chickens Fed Kaura Sorghum Diets with Full-Fat Soya Bean

Parameters	Diets					SEM
	1 (0%)	2 (25%)	3 (50%)	4 (75%)	5 (100%)	
GLu (mMol/l)	4.28	9.20	6.95	6.75	7.35	1.24 ^{NS}
CHO (mMol/l)	2.23	2.63	2.53	2.38	1.93	0.23 ^{NS}
UA (mMol/l)	1786.50	270.00	216.25	199.00	297.25	37.52 ^{NS}
Ca (mMol/l)	2.15 ^a	2.08 ^{ab}	1.95 ^b	1.93 ^b	1.93 ^b	0.05**
UREA (mMol/l)	1.80	1.38	1.38	1.18	1.25	0.15 ^{NS}
CREAT (mMol/l)	57.00	49.50	41.50	40.50	50.50	4.71 ^{NS}
Na (mMol/l)	140.75	141.75	141.25	141.25	142.00	2.10 ^{NS}
C ₁₂ (mMol/l)	107.50	108.50	105.25	105.75	107.75	3.02 ^{NS}
AST u/l	130.75	124.25	117.75	130.00	122.75	4.11 ^{NS}
ALT u/l	13.00	10.00	11.00	13.25	6.75	1.95 ^{NS}
TB (mMol/l)	6.55	5.63	5.23	6.23	5.58	0.53 ^{NS}
CB g/l	6.55	2.83	2.90	3.03	3.03	0.27 ^{NS}
TP g/l	54.00	29.25	63.00	35.00	41.00	10.55 ^{NS}
ALB g/l	14.00	20.75	13.75	13.75	20.75	3.46 ^{NS}

^{ab}Means on the same row bearing different superscripts differ significantly,

NS = Not Significant, SEM = Standard Error of Mean,

GLU = Glucose, CHO = Cholesterol, UA = Uric Acid,

Ca = Calcium, CREAT = Creatinine, Na = Sodium,

AST = Aspartate Transferase, ALT = Alanine Transferase,

TB = Total Bilirubin, CB = Conjugate Bilirubin,

TP = Total Protein, ALB = Albumin.