PERFORMANCE AND CARCASS CHARACTERISTICS OF BROILER CHICKENS FED GRADED LEVELS OF *KALGO*POD MEAL (*PILIOSTIGMA THONNINGII*)

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ABSTRACT
An experiment was conducted to determine the effect of Kalgopod meal (KPM) on the carcass characteristics of broiler finisher. Completely randomized design was used with four treatment groups replicated four times for four weeks designated as: 0:control, 5, 7.5 and 10% KPM. Feed and water were supplied ad libitum. The results indicated that there were significant differences across performance parameters considered, in fact treatment four with higher inclusion level of test ingredient was found to have been well utilized by the birds ($p<0.05$). Results of carcass analysis revealed that, significant differences ($p<0.05$) were observed in slaughter weight and dressing percentage while neck, wings, breast, back, thigh, drum stick and shank ($p>0.05$). Inclusion of KPM in poultry feeding had no adverse effect on carcass characteristics.

Keywords: *Kalgo* pod meal, performance, carcass, broiler

INTRODUCTION
Poultry can thrive well where humans are living particularly tropical areas (Mogesse, 2007). Moreover, poultry are able to adapt to most areas of the world and have short generation interval (Smith, 2001). They are resources that are available to even the poorest family (Banerjee, 1998). Maharjan *et al.* (2021) highlighted that food production system needs to be sustainable including poultry sector to feed the increasing global population. The availability of maize all year round for poultry feed has reduced and this could be attributed to competition for maize by humans and animals, irregular rainfall pattern and high cost of maize (Oladimije *et al*., 2020). The present insecurity that has devastated most parts of Northern Nigeria has also caused decline in maize production (Ogunwole, *et al.* 2016). In view of these limiting circumstances, it becomes imperative to search for non-conventional feed sources that will be well suited for sustainable poultry production (Oyebimpe *et al.,* 2006). *Kalgo*pod meal has been used as rich source of energy (Adeyemo and Borried, 2002). The objective of this study was to determine the effect of KPM on the performance and carcass characteristics of broiler finisher fed graded levels of KPM.

MATERIALS AND METHODS
Experimental site experimental birds and their management
The experiment was conducted at the Department of Biology, Faculty of Natural and Applied Sciences, Umaru Musa Yar'adua University, Katsina. Located on (GPS Coordinates: 12° 59' 52''N, 7° 35' 58''E) (KTSG, 2013).
A total of twenty- four Cobb500 broiler chicks (from Olam Hatcheries) of 2-weeks old were purchased from Danhassan Livestock and Poultry Services, Katsina. Adopted for eleven days and manage on deep litter system. They were fed commercial diet during acclimatization and experimental diet during the experiment. Three days to commencement of the experiment commercial diet was gradually withdrawn at the rate of: 25+75%, 50+50% and 75+25% experimental and commercial diets respectively. Feeds and water were provided *ad libitum* throughout acclimatization and experimental periods. The experiment lasted for four weeks all other management practices were strictly observed
Experimental design, meal preparation and gross composition of experimental diets
The experimental treatments were arranged in a completely randomized design with four treatment groups as 0-control, 5, 7.5 and 10% KPM corresponding to treatments T1, T2, T3 and T4 respectively. Meal was prepared by harvesting of *Piliostigma thoningii* (*Kalgo*pods), air dried and pulverized with pestle and mortar. Anti-nutritional factors in the pods were chelated by heating using frying pan.

Table1: Gross composition of the experimental diets

Feed Ingredients	Treatments			
	T1control 0%KPM	**T2 5% KPM**	**T3 7.5 KPM**	**T4 10% KPM**
Maize	51.8	52.3	52.05	48.8
Maize offal	15	5	0	0
Wheat offal	12	12.5	15.25	16
Kalgopod meal	0	5	7.5	10
Groundnut cake	10	10	10	10
Soybean meal	6	10	10	10
Blood meal	2	2	2	2
Bone meal	2	2	2	2
Salt	0.3	0.3	0.3	0.3
Methionine	0.2	0.2	0.2	0.2
Lysine	0.2	0.2	0.2	0.2
Vitamin premix*	0.5	0.5	0.5	0.5
Total	100	100	100	100
Proximate analysis				
ME(Kcal/kg)	2817.05	2810.21	2816.98	2817.00
Crude protein	19.00	19.19	19.29	19.37

*ME: metabolisable energy; Composition of premix (Biomix) supplying the following per kg diet. Vit. A=12000IU, Vit. E=15000IU, Folic acid=100mg, Vit. D_3=2.500IU, Nicotine acid=400mg, Panthothenic acid=15000mg. I=1750mg, Fe=40,000mg, Zn=50,000mg, Mn=1,000mg, Biotin=600mg, Vit. C=30,000mg, Cu=200mg, Si=100mg.

Data collection and analysis

An electronic scale (Sartorius, CP 245S) was used for weights of all parametres in the research and data were analyzed using GraphPad InStat Statistical Package (GraphPad InStat®, version 3.05, 32 bit for Win 95/NT, GraphPad Software Inc., 2000).

RESULTS AND discussion

Investigation to find new feed material is common practice in animal nutrition. Al-Beitawi and Goushein (2008) observed significant improvement in the final live weight of broilers fed diets supplemented with black seed at 1.5% inclusion level. Carcass weight and dressing percentage were improved in birds fed 5% and 7.5% of *Kalgo*pod meal in present study; the differences observed in weight gained could be ascribed to varying graded levels of *Kalgo*pod Meal (*Piliostigma thonnigii*) and possibly to genetic characteristics for different growth patterns as suggested by (Soares *et al.* 1991). The result of current study showed that, carcass weight was significantly affected by treatments. The carcass weights recorded ranged from 871.20±0.36 to 174.52±0.44g and significant differences were recorded ($p<0.05$), variation in weights might be associated with the glycogen stores in the muscle of the birds. However, this result is in line with the findings of Denli *et al.* (2003).

The growth performance parameters of the broiler are indicated in Table 2 significant differences were observed in all parameters tested. Akinmutimi and Anakebe (2008) reported that diets *kalgo*pod meal resulted in increased feed utilization efficiencies. Based on the above, FCR feed intake and weight gain is be expected to be improved. Feed intake showed significant variations ($p<0.05$) as observed in current study, supporting (Scott *et al*., 1999). Contrary to the findings of Inaku *et al*. (2011) who found that including *Kalgo*pod meal at high levels led to depressed growth because of the low value of fiber itself, decreased dry matter apparent digestibility and reduced availability of other nutrients for growth. Present research used minute quantities to avoid improper utilization of feed, significantly different ($p<0.05$) were observed across parameters tested.

The primal cuts (breast, thigh, drumstick, back, wing, neck and shank) of the birds are presented in Table 3 cut-up parts weights were not significantly difference this was contrary to report of Cheikh-Rouhou *et al*. (2007) who revealed that graded levels of KPM (*Piliostigma thonnigii*) have a good

effects and enhanced availability of mineral metabolism perhaps, KPM contained macro-minerals (mg/100gm) i.e. Ca (572), P (540), Mg (264), Na (17.8) and K (810) .

Table 2: ***Gross performance of broiler finisher chickens fed graded levels of kalgopod meal (Piliostigma thonnigii)***

Parameters (g)	**T1control 0%KPM**	**T2 5% KPM**	**T3 7.5 KPM**	**T4 10% KPM**
Initial weight	320.0±0.81[a]	320.0±0.81 [a]	321.0±0.95 [a]	320.0±0.81 [a]
Final body weight gained	1096.31±2.44[d]	1196.60±0.81[a]	1094.86±10.53[c]	1160.31±8.16[b]
otal weight gained	775.31±2.78[c]	876.60± 0.73 [a]	773.29±1.62[d]	838.56±4.22[b]
Daily weight gained	36.96±0.81[b]	41.74±2.90 [a]	36.85±3.27[b]	30.31±3.10[c]
Daily feed intake	108.33±2.16[c]	116.66±2.15[b]	115.87±2.16[b]	122.61±0.82[a]
F.C.R	2.93±0.01[c]	2.79±0,14[c]	3.14±0.01[b]	4.08±0.00 [a]

[a,b,c,d] means in the same rows with different superscripts differ significantly ($p<0.05$)

Table 3: ***Carcass characteristics of broiler finisher chickens fed graded levels of kalgopod meal (Piliostigma thonnigii)***

Parametres (g)	**T1control 0%KPM**	**T2 5% KPM**	**T3 7.5 KPM**	**T4 10% KPM**
Final live weight	1096.31±0.59[c]	1196.60±0.34[a]	1094.86±0.47[c]	1160.31±1.6[b]
Slaughtered weight	1076.31±0.37[c]	1178.34±0.49[a]	1068.50±0.3[d]	1140.54±0.7[b]
Defeathered weight	1034.22±0.20[d]	1139.14±1.21[a]	1043.85±0.23[c]	1113.02±0.1[b]
Carcass weight	753.64±1.77[c]	871.12±0.36[a]	749.52±0.44[d]	832.42±0.25[b]
Dressing percentage (%)	68.74±0.24 [b]	68.74. ±0.20[b]	68.46±0.07[b]	70.42±0.05[a]
Cut-parts expressed as % of Live weight				
Neck	3.79 ±0.81	3.76±0.81	3.980±0.81	3.960±0.81
Wings	8.28±0.81	6.84 ±0.81	7.485±0.82	7.90±0.81
Breast	21.31±1.25	21.91±0.95	30.84±14.17	22.96±0.81
Back	10.88 ±0.18	9.97±0.81	10.83±0.18	10.36±0.81
Thigh	8.74±0.83	8.11±0.81	8.64±0.18	8.47±0.18
Drumstick	8.59±0.018	8.06 ±0.18	8.55±0.18	8.22±0.18
Shanks	4.42±0.18	4.19±0.18	4.06±0.18	4.75±125

[a,b,c,d] means in the same rows with different superscripts differ significantly ($p<0.05$)

CONCLUSION

It can be concluded that *kalgo*pod meal in broiler finisher gave optimal performance and carcass characteristics

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