EFFECT OF GRADED LEVELS OF MANGO SEED KERNEL (KANBIRI) BASED DIETS ON CARCASS CHARACTERISTICS OF BROILER FINISHER CHICKENS

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ABSTRACT

Effect of graded levels of mango seed kernel (Kanbiri) based diets on carcass characteristics of broiler finisher chickens was investigated. Local variety (kanbiri) of mango seed kernel was soaked for 72hours and fed to broiler finisher chickens at 0, 20, 40, 60, 80 and 100% inclusion levels designated as T_1, T_2, T_3, T_4, T_5 and T_6, respectively. The 20% inclusion of mango seed kernel showed the best results ($P<0.05$) in live weight, dressed weight, dressing percentage, thigh and breast weight, respectively. These parameters declined with increasing levels of mango seed kernel in the diets. Weights of internal organs increased as the levels of mango seed kernel increased in the diets of the birds. It was concluded that mango seed kernel (Kanbiri) can be soaked for 72hours and fed to broiler finisher chickens at 20% inclusion level.

Keywords: mango seed kernel, kanbiri, carcass, broiler

INTRODUCTION

Cereal grains such as maize have remained the major energy source in poultry diets (Idachaba, 2012). As climate is fast changing, the production of maize cannot keep pace with its demand for food and industrial uses (Kurtong, 2014). This calls for concerted effort in the search for alternative feed materials of which mango seed kernel is highly promising (Idris, 2012). Mango seed kernel (MSK) contains carbohydrate (69.2 - 80%), protein (7.5 – 13%), fibre (2.0 – 4.6%), ash (2.2 – 2.6%), calcium (0.21%) and phosphorus (0.22%), which is comparable to maize, depending on the variety (Diarra *et al.*, 2010). Rocha *et al.* (2007), Fowomola (2010), Dakare *et al.* (2012) and Idris (2012) studied the effect of several processing methods on anti-nutritional factors in mango seed kernel. Their reports showed that animal nutritionists can bridge the gap in animal protein intake if more attention is paid to processing and utilization of mango seed kernel. Consequently, the effect of graded levels of local variety (kanbiri) of mango seed kernel based diets on carcass characteristics of broiler finisher chickens was evaluated in this study.

MATERIALS AND METHODS

Collection and processing of mango seed kernel

Local variety (kanbiri) of mango seed kernel was collected from Zaria city, Sabon Gari, Soba and Giwa Local Government Area in Kaduna State. The collection was done during the months of april and may which represents the peak of mango production in Zaria. the seed kernel was obtained by cutting the seed coat using a knife and crushing them into pebbles (small particle sizes). Later, 100g of crushed MSK per litre of water was soaked for 72 hours in plastic containers. The water was drained and another replaced at regular intervals of 8 hours for 3 days. The soaked MSK was sundried, milled and analysed for proximate compositions and anti-nutritional factors.

Source of experimental birds

The birds used in this experiment were purchased from Nu-BREED farms Ibadan, Oyo State.

Preparation of experimental diets

Six experimental diets were formulated to meet the nutrient requirement of broiler finisher chickens according to recommendations of NRC (1994). Local variety (Kanbiri) of mango seed kernel was included in the diets at 0, 20, 40, 60, 80 and 100% inclusion levels designated as T_1, T_2, T_3, T_4, T_5 and T_6 respectively (Table 1).

Experimental design and management of birds

Two hundred and seventy (270) broiler chickens were raised for 56days in a feeding trial. The experimental design was a completely randomized design. The birds were randomly assigned to six dietary treatment groups each replicated three times with 15 birds per replicate. At the end of the feeding trial, three birds were selected from each treatment based on the group mean weight for carcass analysis. The selected birds were fasted overnight and thereafter bled by severing the

jugular vein, followed by scalding in hot water and subsequently defeathered. Their live weights were taken after which they were bled. Dressing percentage was calculated, while weights of the breast, thigh, wing, back, heart, kidney, liver, gizzard, head, neck, shank, and viscera were taken and expressed as percentages of the live weight.

Statistical analysis

Data obtained from all experiments were subjected to analysis of variance, using the General Linear Model procedure of SAS (2001). Significant treatment means were separated using Duncan's Multiple Range Test according to procedures described by Steel and Torrie (1980).

RESULTS AND DISCUSSION

Effect of graded levels of mango seed kernel (Kanbiri) based diets on carcass characteristics of broiler finisher chickens is presented in Table 2. The live weight, dressed weight, dressing percentage, thigh and breast weight were significantly (P<0.05) affected by varied levels of mango seed kernel. These parameters declined with increasing levels of mango seed kernel in the diet of the birds. Birds fed 0 and 20% inclusion of mango seed kernel showed the best results while 80 and 100% inclusion levels showed the poorest result in all parameters studied. The best values observed in carcass characteristics for birds fed 20% inclusion level of mango seed kernel was attributed to better utilization at that level. Higher levels of mango seed kernel beyond 20% inclusion negatively affected carcass characteristics probably due to residual effect of anti-nutrients at higher inclusion levels. Fetuga *et al.* (1975) suggested that carcass quality is closely related to dietary nutrient quality. Internal organs such as heart, kidney, intestine, lungs and gizzard significantly (P<0.05) increased with increasing levels of mango seed kernel in the diet of the birds. Dauda (2006) reported that oil seeds processed by soaking may contain some residual anti-nutrients which may affect utilization at high inclusion levels. Birds fed 20% inclusion level of mango seed kernel showed normal weights of internal organs compared higher levels of mango seed kernel which increased organ weights.

Table 1: Feed composition of experimental broiler finisher diet

Ingredient/Diets	0%	20%	40%	60%	80%	100%
Maize	57.61	45.63	33.64	21.66	9.66	0.00
Groundnut cake	21.39	21.85	22.32	22.77	23.25	21.39
MSKM	0.00	11.52	23.04	34.57	46.09	57.61
Soybean (full fat)	10.00	10.00	10.00	10.00	10.00	10.00
Fish meal	3.00	3.00	3.00	3.00	3.00	3.00
Wheat offal	4.00	4.00	4.00	4.00	4.00	4.00
Bone meal	3.00	3.00	3.00	3.00	3.00	3.00
Salt	0.30	0.30	0.30	0.30	0.30	0.30
Lysine	0.20	0.20	0.20	0.20	0.20	0.20
Methionine	0.25	0.25	0.25	0.25	0.25	0.25
Vitamin Premix	0.25	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100	100
Calculated analysis						
ME (kcal/kg)	3013	2972	2976	2959	2954	2944
Crude protein %	21.0	21.0	21.0	21.0	21.0	21.0
Ether extract	6.5	6.5	6.5	6.7	6.9	6.5
Crude fibre	3.3	3.4	3.4	3.5	3.7	3.6
Calcium %	1.3	1.3	1.2	1.2	1.2	1.2
Phosphorus%	0.9	0.9	0.8	0.8	0.8	0.8
Lysine	1.12	1.1	1.1	1.1	1.1	1.1
Methionine	0.6	0.55	0.53	0.55	0.55	0.55

* Vitamin premix! Composition of vitamin per kg is as follows: Vitamin A, 8000iu; Vitamin D31600iu; Vitamin ESiu; Vitamin K 0.200mg; Vitamins B, thaimine B. 0.5mg; Riboflavin B2 4mg; Pyridoxine B6 0.015mg; Niacin

0.015mg; B12 0.01mg; Pantothenic acid 0.5mg; folic acid 0.5mg and Biofin 0.020mg; chlorine chloride 0.02mg; Anti-oxidant 0.125g and Minerals (Mn, Zn, Fe, Cu, I, Si Co) 0.056g.

Table 2: Effect of graded levels of local variety (kanbiri) of mango seed kernel based diets on carcass characteristics of broiler finisher chickens

Parameters	0%	20%	40%	60%	80%	100%	SEM
Live wt (g)	1500.00^{a}	1400.00^{a}	1133.33^{b}	1033.33^{b}	866.67^{c}	766.67^{c}	49.06
Slaughter wt	1333.33^{a}	1300.00^{a}	1033.33^{b}	900.00^{bc}	566.6^{cd}	700.00^{d}	52.70
Dressed wt (g)	1233.33^{a}	1200.00^{a}	966.6^{b}	800.00^{bc}	666.67^{cd}	600.00^{d}	57.73
Dressing%	58.01^{ab}	64.5^{a}	53.03^{b}	54.85^{b}	50.83^{c}	50.38^{c}	1.69
Thigh (%)	11.12^{a}	12.86^{a}	10.99^{b}	9.80^{bc}	9.95^{bc}	9.15^{c}	0.14
Breast (%)	14.04^{a}	14.11^{a}	11.99^{b}	11.84^{b}	10.12^{c}	10.22^{c}	0.26
Back (%)	12.91	14.64	13.82	12.43	13.41	12.73	0.67
Head %	3.22^{c}	3.75^{b}	4.07^{ab}	3.67^{bc}	4.04^{ab}	4.36^{a}	0.15
Neck (%)	6.60	6.30	6.62	5.54	5.46	5.32	0.50
Wing (%)	8.48	8.83	8.70	8.57	9.74	9.46	0.49
Liver (%)	2.97	2.96	3.14	3.51	3.22	3.50	0.32
Spleen%	0.18	0.16	0.15	0.17	0.22	0.17	0.03
Heart%	0.56^{b}	0.68^{ab}	0.60^{ab}	0.70^{ab}	0.61^{ab}	0.84^{a}	0.08
Kidney%	0.55	0.71	0.81	0.72	0.91	0.89	0.09
Lungs%	0.53^{c}	0.54^{c}	0.63^{b}	0.75^{b}	1.12^{a}	0.99^{a}	0.13
Gizzard full%	4.33^{c}	4.41^{c}	4.23^{b}	5.68^{ab}	6.05^{ab}	6.36^{a}	0.29
Gizzard empty	2.62	2.68	3.15	2.78	3.01	2.99	0.25
Intestine lgt (cm)	250.67	230.00	238.67	233.00	243.33	243.33	12.89
Intestine full%	6.41^{c}	8.56^{c}	11.24^{ab}	10.58^{b}	12.01^{ab}	13.09^{a}	0.71
Intestine empty%	3.45^{b}	3.81^{b}	6.16^{ab}	6.02^{ab}	6.82^{a}	6.85^{a}	0.83
Abdominal fat%	1.80	1.78	0.80	1.26	1.56	0.97	0.30
Shank%	5.21^{b}	6.36^{a}	5.76^{ab}	5.51^{ab}	5.51^{ab}	5.36^{ab}	0.32

abcd = Means with different superscripts in the same row are significantly different ($P < 0.05$)
SEM = standard error of the mean

CONCLUSION

The 20% inclusion of mango seed kernel showed the best result in live weight, dressed weight, dressing percentage, thigh and breast weight. These parameters declined with increasing levels of mango seed kernel in the diets. Weights of internal organs such as heart, kidney, intestine, lungs and gizzard increased as the levels of mango seed kernel increased in the diets of the birds. It was concluded that mango seed kernel (Kanbiri) can be soaked for 72hours and fed to broiler finisher chickens at 20% inclusion level.

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Wheat offal	4.00	4.00	4.00	4.00	4.00	4.00
Bone meal	3.00	3.00	3.00	3.00	3.00	3.00
Salt	0.30	0.30	0.30	0.30	0.30	0.30
Lysine	0.20	0.20	0.20	0.20	0.20	0.20
Methionine	0.25	0.25	0.25	0.25	0.25	0.25
Vitamin Premix	0.25	0.25	0.25	0.25	0.25	0.25
Total	100	100	100	100	100	100
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Crude fibre	3.3	3.4	3.4	3.5	3.7	3.6
Calcium %	1.3	1.3	1.2	1.2	1.2	1.2
Phosphorus%	0.9	0.9	0.8	0.8	0.8	0.8
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