GROWTH PERFORMANCE OF STARTER BROILER CHICKENS FED RAW *SENNA OBTUSIFOLIA* SEED MEAL

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ABSTRACT
An experiment to determine the growth performance of starter broiler chickens fed raw Senna obtusifolia seed meal (SOSM) was conducted. A total of 150 Arbor-Acre broiler chickens were purchased and fed control diet for 6 days before randomly allotted to five experimental Treatments 1 to 5 (T1 to T5) of 30 birds each, replicated 3 times with 10 birds per replicate in a completely randomized design. The levels of the raw SOSM were 0, 2.5, 5.0, 7.5 and 10%. The experiment lasted for 4 weeks. Results showed that as the level of raw SOSM increased in the diet beyond 5%, the lower the final live weight and daily gain of starter broiler birds. It was concluded that raw SOSM could be included up to 5% in starter broiler diet.

INTRODUCTION
Feeding constitutes an important part of poultry production. Ukachukwu (2015) opined that in poultry and piggery, feed cost is put at about 70-80% of total cost of production because of expensive feed ingredients such as maize and soya bean. This according to the author, is made complex and complicated by competition among human, the industry and farm animals for the same food items as either food for man, feed for animals and raw materials for the industry. Reducing feed cost is a priority for every poultry farmer and animal nutritionist. One of the ways of getting round this problem of high feed cost is by looking for alternative feedstuffs, which have little or no dietary value for man and industry. The use of legume seeds in monogastric nutrition has attracted the attention of researchers worldwide. Several conventional legume seeds such as sword bean, pigeon pea, mucuna species and *Cajanus cajan*, to mention just a few, have been studied and evaluated for inclusion in non-ruminant diets in Nigeria (Udedibie and Nkwocha, 1990; Leon *et al.,* 1991; Ologhobo *et al*., 1993; Ukachukwu, 2000; Akinmutimi, 2004; Ekwe, 2014). There is, however some unconventional plants seeds that are still under-utilized, which little are known about their chemical composition and nutritional values, like sickle pod (*Senna obtusifolia)* seeds. There is, therefore, the need for continuous screening of minor legume seeds like *Senna obtusifolia* for use as unconventional alternative feed resource in monogastric diets. It was in view of the forgoing that this research was undertaken to determine the tolerance level of raw *Senna obtusifolia* seed meal on growth performance of starter broiler chickens.

MATERIALS AND METHODS
Senna obtusifolia seeds used were obtained from Bauchi State, Nigeria. The experiment was conducted at the Teaching and Research farm of University of Uyo, One hundred and fifty (150) day-old arbor acre broilers were purchased from a reputable supplier in Uyo metropolis, Akwa Ibom State, Nigeria. The poultry house was washed and disinfected. Prior to the arrival of the chicks, brooding room temperature was raised to 35^0C using kerosene stove and electric bulbs. The floor of the brooder was sprayed with wood shavings of 2cm thickness. Feeding and drinking troughs were provided. On arrival, the chicks were weighed and given anti-stress. The birds were brooded together for the first six days for acclimatization and fed the control diet. On day 7, the birds were weighed and randomly allotted to five experimental treatments with 30 birds per treatment. Each treatment was replicated thrice with 10 birds per replicate, in a Completely Randomized Design (CRD). Treatment 1 was control while raw *Senna obtusifolia seed* meal was included at 2.5, 5.0, 7.5 and 10% in treatments 2, 3, 4 and 5 respectively in the diet (Table 1). Feed and water were provided *ad libitum* throughout the experiment which lasted for 28 days. Feed intake was determined daily

and weight gain was determined weekly. Necessary vaccinations and medications were strictly adhered to. Data on performance parameters were evaluated and subjected to one-way Analysis of Variance (ANOVA) according to Steel and Torrie (1980) while differences between treatment means were separated using Duncan's Multiple Range Test using computer software IBM SPSS Statistic version 20.

Table 1: Ingredients and nutrient composition of raw *Senna obtusifolia* seed meal fed to starter broilers

Ingredients %	**(T1) 0.0**	**Levels (T2) 2.50**	**Of (T3) 5.0**	**Inclusion (T4) 7.50**	**(%) (T5) 10.0**
Maize	49.18	46.71	44.26	41.81	39.34
Soya bean meal	33.81	33.79	33.74	33.69	33.66
*S. obtusifoli*a seed meal	-	2.50	5.00	7.50	10.00
Palm kernel meal	10.00	10.00	10.00	10.00	10.00
Fishmeal	3.00	3.00	3.00	3.00	3.00
Bone meal	3.00	3.00	3.00	3.00	3.00
Methionine	0.25	0.25	0.25	0.25	0.25
Lysine	0.25	0.25	0.25	0.25	0.25
Vit/TM premix*	0.25	0.25	0.25	0.25	0.25
Salt	0.25	0.25	0.25	0.25	0.25
Total	**100**	**100**	**100**	**100**	**100**
Calculated nutrients					
Crude Protein (%)	23.00	23.00	23.00	23.00	23.00
Crude Fibre (%)	4.67	4.85	5.03	5.21	5.39
Ether Extract (%)	4.01	3.96	3.91	3.86	3.81
Calcium (%)	1.30	1.31	1.32	1.34	1.35
Phosphorus (%)	1.06	1.07	1.07	1.08	1.09
ME (Kcal/g)	2850	2832	2813	2795	2776

*1kg of premix contains. vitamins A (5,000,000Iu), Vitamin D_3 (1,000,000 1U), Vitamin E (16,000mg), vitamin K_3 (800mg), vitamin B_1 (1,200mg), Vitamin B_2 (22,000mg), Niacin (22,000mg), Calcium panthothenate (4,600mg), Vitamin B6 (2000mg), Vitamin B_{12} (10mg), Folic acid (400mg), Biotin (32mg), Choline chloride (200,000mg), Manganese (48,000mg), Iron (40,000mg), Zinc (32,000mg), Copper (3,400mg), iodine (600mg), Cobalt (120mg), Selenium (40mg), antioxidant (48,000mg).

RESULTS AND DISCUSSION

The growth performance of starter broiler chickens fed raw *Senna obtusifolia* seed meal is shown in Table 2. There were significant differences ($P<0.05$) among the treatment means for all the parameters considered, except for the initial weights. The result showed that the final live weight, daily feed intake and daily weight gain followed the same trend. The mean final weights were 921g for the control, 910g for T2 with 2.5% and 906g for T3 with 5.0%, 745g for T4 with 7.5% and 681g for T5 with 10%. Inclusion of 7.5 and 10% S. obtsusifolia affected final live weight negatively. The final live weight of control, 2.5 and 5.0% was similar. It was observed that above 5.0% inclusion live weight decreased with increased level of raw *Senna obtusifolia* seed meal. Daily weight gain followed similar trend as the final live weight. The feed intake of control, 2.5 and 5.0% were the same. It was also observed that feed intake was depressed by 7.5 and 10%. The result also showed no significant difference in feed conversion ratio and protein efficiency ratio up to 5.0% inclusion compared to the control diet.

The depression in feed intake and poor live weight could be as a result of presence of some anti-nutritional factors like saponins, tannin and phytate in the raw seeds. This agreed with Akinmutimi (2004), who reported poor palatability and consequently low feed intake in diets containing sword bean because of tannin content in raw sword bean. According to him, tannins could induce low feed intake due to its astringent property, as a result of its ability to bind with the protein of saliva and mucosa membrane. This he also opined was as a result of the effect of other anti-nutritional factors such as saponins, phytate, cyanogenic glycosides, trypsin inhibitors, canavanin and con-canavanin A

in the raw sword bean. According to Aletor and Fasuji (1997), cyanogenic glycoside, for instance, upon hydrolysis releases hydrogen cyanide, a substance which has the ability to cause marked weight reduction. The authors observed that cyanide detoxification route in man and animals is through cyanide thiocyanate sulphur transferase (rhodanase pathway), which generally requires organic sulphur donors in the form of methionine and cysteine, thereby precipitating methionine deficiency in an otherwise balanced diet. Akinmutimi (2004) reported that it is this methionine deficiency that resulted in poor growth. Feed conversion ratio (FCR) is an important index of performance which is a direct indication of how best feed offered to birds was utilized for meat production. The lower the FCR value, the better the feed utilization, thus birds with higher FCR value had suppressed growth. This result is in consonance with similar report by Tuleum *et al.* (2009), that broiler chicks on 10% raw *Mucuna pruriens* in balanced formulated ration had depressed growth, due to the limitation imposed on the birds by anti-nutritional factors present in the diet. Akinmutimi (2004) also reported that the poor weight gain by starter broiler birds fed raw sword bean may be due to poor nutrient utilization.

Table 2: Growth performance of starter broiler chickens fed raw *Senna obtusifolia* seed meal

Parameters	Levels of Inclusion of Raw *Senna obtusifolia* Seed Meal					
	T1 (0%)	T2 (2.5%)	T3 (5%)	T4 (7.5%)	T5 (10%)	SEM
Initial weight (g)	38.02	38.02	38.02	38.02	38.02	0.00
Final weight (g)	921[a]	910[a]	906[a]	745[b]	681[c]	27.49
Average Daily Weight Gain(g)	31.52[a]	31.15[a]	30.99[a]	25.25[b]	22.95[c]	1.03
Average Daily Feed Intake (g)	70.37[a]	69.98[a]	69.56[a]	61.34[b]	54.23[b]	1.34
Feed Conversion Ratio	2.23[c]	2.25[c]	2.24[c]	2.43[a]	2.36[b]	0.03
Protein Efficiency Ratio	1.95[a]	1.94[a]	1.94[a]	1.79[b]	1.84[b]	0.03

[a,b,c] Means with different superscripts in the same row are significantly different (P<0.05)

CONCLUSION

The growth performance of starter broiler chickens fed raw *Senna obtusifolia* seed meal reduced live weight and feed intake beyond 5% inclusion level. In view of the above, raw *Senna obtusifolia* could be included in the diet of starter broiler diet up to 5% without any deleterious effect on growth performance.

ACKNOWLEDGEMENT

The authors are grateful to Prof Demo Kalla of Abubakar Tafawa Balewa University, Bauchi, Nigeria for providing the seeds and to Tertiary Education Trust Fund (TETfund) for sponsoring the research.

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