

BLOOD PROFILE OF WEANER PIGS FED DIETS CONTAINING GRADED LEVELS OF YAM AND SWEET POTATO PEEL MEAL

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ABSTRACT

Animal nutritionists in Nigeria have been persistently challenged by the quest for alternative feeding options for monogastric animals particularly pigs. A study was conducted to investigate the blood profile of weaner pigs fed diets containing graded levels of combined yam peel and sweet potato peel meal. They were allocated to four dietary treatments. Each treatment was replicated thrice, and each replicate had two (2) pigs in a Completely Randomized Design (CRD). Diet one (D1) was a maize-based diet while combination of and yam and sweet potato peel meal replaced maize quantitatively in a ratio 3:2 in diet 2, 3 and 4 at 5%, 10% and 15% levels respectively. The proximate % and gross energy composition of the test feed stuffs (combined sweet potato peel and yam peel meal) were as follows: crude protein 9.11%, ether extract 1.20%, crude fibre 3.47%, ash 6.89%, dry matter 89.10% and gross energy 3.010 (Kcal/kg). There were no significant differences ($p < 0.05$) in all the haematological parameters measured except for White blood cell (WBC) counts which was within the normal range of WBC of weaner pigs. The blood chemistry values for pigs in all the diets were within the normal range of biochemical values for weaner pigs. It was concluded that yam and sweet potato peel meal had no deleterious effect on the blood constituents (haematology and biochemical indices) of weaner pigs.

Keywords: Weaner pigs, haematology, serum chemistry, yam peel, sweet potato peel

INTRODUCTION

The search for alternative feeding stuff for monogastric animals (especially pigs) has continued to challenge animal nutritionists in Nigeria since the past two decades. The search is because of high cost of the conventional feeding stuff which are also in high demand by humans and industries (Onyimonyi and Okeke, 2008). One of the plausible ways of solving this problem especially as regards energy sources is the use of kitchen waste such as sweet potato and yam peel (Anakebe, 2006). They are cheap, widely available and of no industrial use (Akinmutimi and Anakebe, 2008). Sweet potato peel meal contains about 6.3% crude protein and metabolisable energy of 3411kcal/kg (Osuagwu, 2006) while yam peel meal contains about 11% crude protein and metabolisable energy of about 2604 kcal/kg (Akinmutimi and Osuagwu, 2008). The information on the effect of combined use of these peel meal in weaner pigs' diet in place of maize in a maize -based diet on organ weights and blood constituents of weaner pigs are yet to be reported.

MATERIALS AND METHODS

The experiment was carried out in the Piggery Unit of Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria. Umudike is located on latitude 5° 28 North and longitude 7° 31 East and lies at an altitude of 122m above sea level (NRCRI, 2023). Twenty four (24) weaner pigs were used for this study. They were randomly assigned to four dietary treatments and each treatment had six (6) weaner pigs. There were three replicates and each replicate had two weaner pigs. The experimental design was a Completely Randomized Design (CRD). Medication against diseases was administered and feed and water were provided to the pigs *ad-libitum* throughout the duration of the experiment which lasted 56 days. Four diets were formulated for the experiment, Diet 1 was maize-based and served as control while the test ingredient (sweet potato and yam peel meal ratio 3:2) quantitatively replaced 0, 5, 10 and 15% of maize in diets 2, 3 and 4 respectively (Table 1). Sterilized

needles and syringes were used to collect 2ml of blood samples from the ear veins of each of the pigs selected from the 4 (four) treatments. The blood was put into labeled sterile universal bottles containing ethylene diamine tetra- acetic acid (EDTA) to prevent coagulation. The data on blood constituents and organ weights were all subjected to Analysis of variance in accordance with Steel and Torrie (1980) and significant means were separated using Duncan Multiple Range Test (Duncan, 1955).

Table 1: Experimental diets with percentage composition and level of inclusion of sweet potato/yam peel meal

INGREDIENTS	T1	T2	T3	T4
Maize	45.00	40.00	35.00	30.00
Sweet potato peel meal	-	3.00	6.00	9.00
Yam peel meal	-	2.00	4.00	6.00
Maize offal	20.05	20.05	20.05	20.05
Soya bean meal	13.00	13.00	13.00	13.00
Palm kernel cake	13.00	13.00	13.00	13.00
Blood meal	3.00	3.00	3.00	3.00
Fish meal	2.00	2.00	2.00	2.00
Bone meal	3.00	3.00	3.00	3.00
Common salt	0.50	0.50	0.50	0.50
Vit premix	0.25	0.25	0.25	0.25
Methionine	0.10	0.10	0.10	0.10
Lysine	0.10	0.10	0.10	0.10
Total	100.00	100.00	100.00	100.00
Crude protein (%)	17.9055	17.7235	17.7235	17.6325
ME (kcal/g)	2782.13	2764.92	2764.92	2747.63

Premix composition. Vit. A, 8,000, 0001.U, Vit D3, 2,000,0001U, Vit. E, 5000mg, Vit. K, 2000mg, Folic Acid, 500mg Niacin 15,000mg, Calpan 500mg, Vit. B2, 8000mg, Vit. B12 10mg, Vit. B1 1500mg, Vit. B6 1500mg, Biotin 20mg Antioxidant, 125,000mg

RESULTS AND DISCUSSION

Results of the haematological indices of weaner pigs fed graded levels of sweet potato and yam peel meal are presented in Table 2. There were no significant differences ($P < 0.05$) for all the parameters measured except for white blood cell (WBC) counts. The WBC values for both the control and the test diets fall within the normal range for weaner pigs as reported by MVM (1998). This implies that the anti-nutritional factors in the test diets are still within tolerable levels (Ologhobo *et al.*, 1993; Akinmutimi *et al.*, 2017). This also probably explains the non-significant differences of all other parameters.

Table 2: Haematological indices of weaner pigs fed graded levels of sweet potato/yam peel meal.

Parameter	T1	T2	T3	T4	SEM
PCV	31.50	30.00	32.27	30.20	3.57
HB	10.57	10.60	11.37	11.10	0.97
RBC	6.68	5.95	6.84	6.79	0.29
WBC	20.80 ³	14.85 ^b	19.80 ^{ab}	18.07 ^{ab}	1.51
MCV	47.07	50.57	46.63	44.27	4.37
MCH	16.13	17.87	16.47	16.33	1.15
MCHC	34.57	35.53	35.40	37.07	1.17

^{ab} Treatment means in the same row with different superscripts are significantly different ($P < 0.05$).

Results of the serum chemistry of weaner pigs fed graded levels of sweet potato and yam peel meal are presented in Table 3. There were significant differences ($P<0.05$) for only alkaline phosphatase and albumin. Nevertheless, they all fell within the normal range of biochemical indices of weaner pigs as reported by MVM (1998). This probably implies that the anti-nutritional factors in the test ingredient do not have negative influence on biochemical indices of the pigs at the levels used in this study.

Table 3: Serum chemistry of weaner pigs fed graded levels of sweet potato/yam peel meal.

(%)	T1	T2	T3	T4	SEM
Total protein	6.95	6.90	7.35	7.40	0.35
Alkaline phosphatase	59.50 ^b	59.50 ^b	66.25 ^a	63.00 ^{ab}	1.62
Albumin	3.55 ^a	3.15 ^b	3.60 ^a	3.75 ^a	0.06
Globulin	3.40	3.95	3.75	3.65	0.35

^{ab} Treatment means in the same row with different superscripts are significantly different ($P<0.05$).

CONCLUSION

The results of the study showed that replacing maize with graded levels of combined yam peel and sweet potato peel meal did not pose any deleterious effects on the blood profile (Haematology and biochemical indices) of weaner pigs. Please indicate which inclusion level you would recommend.

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