EFFECT OF DIETARY SUPPLEMENTATION OF *Petiveria Alliacea (*GUINEA HEN WEED) ON NUTRIENT DIGESTIBILITY OF GROWING PIGS

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ABSTRACT
A feeding trial was conducted using thirty-six unsexed large white x land race grower pigs with body weight range of 8.5-10kg and they were randomly allotted into four dietary treatments on weight equalization basis. The experimental diets consisting of Guinea hen weed leaf (GHW) supplemented at 0, 0.5, 0.75 and 1.0% levels were tagged T1, T2, T3 and T4 respectively. Each treatment has nine pigs with three pigs each in each of the three replicates and were fed ad-libitum throughout the sixteen weeks experimental period. At 14th week, digestibility study was conducted using a pig per replicate housed in a metabolic cage. The pigs were fed with known weight of feed, the remains were weighed. Faecal outputs were also weighed. Cool, clean water was offered liberally to the pigs during the trial. The results of the experiment showed highest ($p<0.05$) crude protein digestibility of 79.24% in pigs offered diet T4 while the lowest (75.53%) was recorded in pigs fed the control diet (T1). The dry matter digestibility increased significantly ($p<0.05$) with increase in GHW supplementation in the diets. Ether extract, crude fibre and ash digestibility reveals no significant ($p<0.05$) different irrespective of the supplementation levels of the GHW. However, the highest (69.24%) ether extract digestibility was recorded in pigs fed 0.75% GHW supplemented diet. Ash digestibility (71.42%) was best in pigs fed 0.5% GHW supplemented diet. It is therefore concluded that dietary supplementation of pig's diet with Guinea hen weed leaf meal up to 1% supported better nutrient digestibility.
Keywords: Guinea hen weed, Digestibility, Pigs, Faecal, Supplementation

INTRODUCTION

Feed supplement has become important in livestock production following the restriction in the use of synthetic antimicrobial additives (Singare *et al.,* 2024). Nutritional manipulation has further helped to improve qualities of livestock products through efficient utilization of energy, prevent fat accumulation in the animal's carcass and ensure increased rate of feed and nutrient conversion (Irekhore *et al*., 2016). The use of plant parts and extracts to improve the productive performance of livestock have been well documented (Mafimidiwo *et al*., 2024). *Petiveria alliacea* is known as Guinea hen weed (GHW) in English and it is called Awogba or Ojusaju, Kanufari and Akwa-Osa by the Yoruba, Hausa and Igbo speaking people of Nigeria respectively (O lomieja *et al.,* 2021) and is one of the known organic supplements in livestock production. It is a wild perennial shrub that grows in Africa and tropical America (Camargo, 2007). *Petiveria alliacea* is used in traditional Latin America herbal medicine as an anti-rheumatic, anti-inflammatory and to treat fever, headache, diabetes,malaria, arthritis, skin allergies and cancer. (Perez-Leal *et al.,* 2006). It contains some phytochemicals and secondary metabolites such as flavonoids, terpenoids, and benzenoids which are commonly identified in the plant (Joao *et al.,* 2018). GHW is used to stimulate the immune system, defend the body against bacteria, viruses and other diseases causing agents (Olufunmilayo *et al.,* 2015). The herb is rich insulfur-containing compounds similar to allicin found in garlic and onion (De Andrade *et al.,* 2012). The utilization of *Petiveria alliacea* in poultry have been well documented (Sobayo *et al.,* 2018; Oyeleke *et al*., 2021) but there is paucity of information on its use on pigs and rabbits. Therefore, this research investigated the effect of dietary supplementation of *Petiveria alliacea* (Guinea hen weed) on the nutrient digestibility of grower pigs.

MATERIALS AND METHODS

Experimental site: The experiment was carried out at the Teaching and Research Farm of the Department of Animal Production Technology, Yaba College of Technology, Epe located on Epe-Ijebu-ode road on longitude 3.97^0 E and latitude 6.47^0 N (Google Earth, 2023). It lies within lowland rain forest vegetation zone of South Western Nigeria.

Test ingredient preparation: The feed ingredients were sourced from a reputable feed milling industry around Ilara area of Epe. *Petiveria alliacea* leaves were sourced from Yabatech college community and air-dried for 3days

and later oven-dried at 65°C for 30 minutes and milled using 2 mm sieve. The milled leaves were bagged in plastic container pending its usage.

Experimental Animal and management: A total of thirty-six unsexed growing pigs (Large white x land race) with varying body weights (8.5-10kg) were procured fromreputable farm in Epe-Ijebu. The pigs were treated with ivermectin using recommended dosage. The pens were washed and disinfected before the arrival of the experimental pigs. The pigs were allowed to acclimatize for two weeks prior to the feeding trials. The pigs were allotted on weight equalization basis with both sexes into four dietary treatments having three pigs per replicate and a total of nine pigs per treatment. The pigs were randomly assigned to the dietary treatments with *Petiveria alliacea* leaf meal supplementation at 0, 0.5, 0.75 and 1.0%. The experiment lasted for sixteen weeks during which the pigs were fed *ad-libitum*.

Data Collection: At the end of 14th week of the experiment, digestibility trial was conducted with three pigs from a treatment representing a pig per replicate and were housed individually in metabolic cages for a week adjustment period. Three days faecal collection was done during which a known quantity of feed was offered daily and the left over measured. Faeces voided were pooled, weigh and oven-dried at 65^0c for 30 minutes. Proximate analysis of the dried excreta samples was carried out (AOAC, 2000). Data generated were subjected to one-way analysis of variance (ANOVA) in a completely randomized design using statistical software (SAS 2002) while differences between significant means were separated using Duncan Multiple Range Test (1995).

Table 1: Ingredients and nutrient composition of experimental diets

Ingredient	T1(0%)	T2(0.50%)	T3(0.75%)	T4(1.00%)
Maize	30	30	30	30
SBM	12	12	12	12
PKC	15	15	15	15
Wheat offal	39	38.50	38.25	38.00
GHW	0	0.50	0.75	1.00
Bone meal	2.0	2.0	2.0	2.0
Limestone	1.4	1.4	1.4	1.4
Premix	0.1	0.1	0.1	0.1
Salt	0.3	0.3	0.3	0.3
Lysine	0.1	0.1	0.1	0.1
Methionine	0.1	0.1	0.1	0.1
Calculated Analysis				
Crude protein	17.67	17.52	17.43	17.28
Crude fibre	14.43	14.22	14.16	14.10
Ether extract	4.77	4.74	4.72	4.68
Ash	3.22	3.17	3.14	3.09
Energy (Kcal/kg)	2550	2584	2544	2540

Table 2: Nutrient Digestibility of growing pigs fed diets supplemented with *Petiveria alliacea.*

Parameters	Supplementation Levels				SEM	P-value
	T1 (0%)	T2 (0.5%)	T3 (0.75%)	T4 (1.0%)		
DMD	79.60[b]	81.23[b]	86.43[a]	85.89[a]	0.20	0.010
CPD	75.53 [b]	76.21 [b]	77.51[ab]	79.24 [a]	0.01	0.029
EED	69.05	68.75	69.24	68.84	0.12	0.438
CFD	68.57	69.05	68.65	69.19	0.03	0.942
ASH	70.27	71.42	69.88	70.35	0.01	0.563

[ab] Means on the same row with different superscript are significantly different (P<0.05) DMD= dry matter digestibility. CPD= crude protein digestibility, CFD= crude fibre digestibility, EED= ether extract digestibilty

RESULTS AND DISCUSSION

The result of this experiment revealed an improved dry matter digestibility (DMD) and crude protein digestibility (CPD) as the level of GHW increases in the diet. This result agrees with the report of Sobayo *et al*. (2018) when he supplemented 500g of dry GHW into the diet of finisher broiler chicken. The improved DMD and CPD observed could be as a result of increased digesta retention time which may have contributed to the absorption time in the intestinal lumen of the pigs. The report is also in tandem with the improved digestibility properties of GHW as reported by Oyeleke *et al*. (2021) when he offered aqueous extract of GHW root and leaf to layers. Meanwhile, an

irregular trend was observed in the ash digestibility, ether extract and crude fibre digestibility in this work. DMD, CFD and ash digestibility matter reveal a no significant effect even as the GHW increases in the diets which is in tandem with the report of Odetola *et al. (*2019) when he fed broiler finisher chicken with *Petiveria alliacea* leaf meal. No particular trend was revealed in the Ash, crude fibre and ether extract digestibility though the ranges recorded were within the ranges reported by Oyeleke *et al.* (2021). The highest EED value (69.24%) was recorded in T3 while the least value of CPD (75.53%) was observed in the control (T1). The Ash digestibility was highest (71.42%) in 0.5% GHW supplemented diet

CONCLUSION

The supplementation of pigs' diet with *Petiveria alliacea* leaf up to 1% level improves their nutrient digestibility without any deleterious effect on the pigs and it is hereby recommended.

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