

PERFORMANCE CHARACTERISTIC AND REGRESSION OF BODY WEIGHT OF THREE BREEDS OF PIGS FED *Moringaoleifera* AND CASSAVA PEEL MEAL.

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ABSTRACT

Data on effect of feeding *Moringaoleifera* and cassava peel as supplement on the performance traits and regression of body weight on body measurement of three breeds of weaner pigs was evaluated. A total of sixty (60) weaned pigs of 3-4 months of age with an average body weight of 8-10kg were used for the study. The pigs were randomized into three treatments according to breed and further divided into two replicate of ten pigs each. The animals were fed the experimental diet for eight weeks. Data on body weight, body measurement and feed intake were collected on weekly basis. Data collected were statistically analyzed using ANOVA (Analysis of Variance) in a complete randomized design and regression of body weight on body measurement at 4 and 8 weeks of age, means were separated using Duncan multiple range test. The study revealed that the dietary supplements significantly ($P < 0.05$) improved the growth performance of the three breeds of grower pigs. Among the weaned pigs, Duroc breed of pig shows the lowest feed intake (131.84) while the highest feed intake was recorded in large white breed of pig (132.70g). Weight gained of the three breeds of pigs shows that there was no significant ($P > 0.05$) difference at the end of the experiment. The least weight gained (8.50kg) was recorded in duroc breed when compared to other breeds of pigs, the highest weight gain was in favour of landrace breed of pigs (9.80kg). The feed conversion ratio shows that there was no significant ($P > 0.05$) difference across the three breeds of weaner pigs. From the study regression result, it was observed that at four weeks of the feeding trials, the body weight of the three breeds of weaner pigs ranges from -2.12 – 7.18 with the highest and lowest recorded for large white and Duroc breeds, respectively. At eight weeks of the experiment large white shows better body weight (28.30kg) compared to the other breeds of pigs, while Duroc breed had the least body weight at eight weeks of age. This study revealed that using *Moringaoleifera* leaves and cassava peels as supplements in pig production have beneficial effects on the growth performance of the grower pigs.

Keywords: breeds, weaner pigs, performance, Regression body weight, *Moringaoleifera*

INTRODUCTION

Agriculture is generally known as the cultivation of crops and rearing of animals for human consumption. In recent time, changes in agriculture by government intervention at all levels have drifted the attention of the masses into various area of agriculture. The

contribution of the agricultural sector to Nigeria gross domestic product (GDP) has increased from 23.86% in the fourth quarter of the 2014 to 24.18% in the first quarter of 2016 (National Bureau of Statistics, 2016).

In time past, cereals grains supply much of the feed used in feeding livestock, especially the feeding of pigs and growing of poultry. The increasing use of cereals in livestock production not only added more cost of feeding to farmers, but it has led to a relative scarcity of this feed since human consumption of cereals increases (Adesehinwa, Makanjuola, and Oluwo, 2011). In Developing countries, of which Nigeria is one, cereal grains are in high demand by humans for use, and the production capacity of cereal grain in Nigeria is inadequate (Adesehinwa, Dairo and Olagbegi, 2008). Even when there is little supply of these grains to the livestock, it is mostly very expensive. Based on this, there is need therefore for livestock producers to look for an alternate means of providing feeds for their livestock which might be relatively cheaper and easy to get.

One of the alternative means of substituting cereals is cassava peels. Cassava is an all season root tuber crop of the humid tropics and ranks among the top ten (10) feed crops in the world. Annual production estimate in Nigeria was 150 million tonnes in 2010 (FAO, 2010). Cassava peel continues to constitute waste in cassava processing industry, such that the peels, leaves and tender stems are underutilized because they are often left to rot away on farms and homesteads after harvesting the roots. Cassava peel has therefore been one feed ingredient which have been consistently incorporated into the diet of pigs as alternative energy source (Irekhore *et al.*, 2006)

A number of browse plants worldwide serves alternate feedstuff for livestock (Aregawi, and Renehart, 2008; Fayemiet *al.*, 2011). common leguminous and non-leguminous browse species that are constantly grazed by ruminants and pseudo-ruminant in different part of Nigeria includes; *Leucaena Leucocephala*, *Adansoniadigitata*, *moringaoleifera*, *Terminaliacatappa*, and *Terminaliasuperba* (Ogunbosoye and Babayemi, 2010; fayemiet *al.* 2011). They have great potentials, especially rich in nutrients for monogastric and ruminant animals. *Moringa* leaves can be substituted in place of rich protein sources especially of plant origin and fish meal in diets of livestock (Aregawi, and Renehart, 2008). The plant can be grown mostly vegetative and has well established high quality forage production. It has the potential to replace conventional feed resources (Sarwatt *et al.*, 2004; Makker and Becker, 1997)

Moringaoleifera plant can be harvested all year without affecting the plant because it can tolerate all seasons. Thus, it is one of the browse plants that have good nutritious food value (Duke, 1998)

In pig production, a good supply of nutrient feed is very paramount to their performance and relatively adds to their value in the market place. In Nigeria, the consumption of pigs is on the increase, and for the producers of pigs to meet the increasing demand, there is need to increase their nutrient and performance. This study was conducted to evaluate the potentials of the *MoringaOleifera* and cassava peels mix with concentrate in the feeding of pigs.

MATERIAL AND METHODS

Experimental Location:

The study was carried out in the piggery unit of the teaching and research farm, and in the laboratory of the Department of Animal Science, Delta State University, Asaba Campus. Asaba Campus is in Oshimili South Local Government area of Delta state. Delta State University, Asaba is located at latitude 16°14N and longitude 6°49E with a temperature of

28±6°C. Rainfall is 1505-1849.3mm, relative humidity of 69.80% and sunshine 4-8bars of the equator within the rainforest agro-ecological zone (Asaba Metrological station, 2016).

Sourcing of Experimental Animal and feed ingredients

The experimental pigs were purchased from Isseleuku, Delta State. Ingredients used to formulate the feed are Wheat offal, Soyabean meal (SBM), Palm kernel cake (PKC), Premix, Salt and Bone meal was purchased at Abraka market, Asaba, Delta State. The cassava peels were collected fresh from local farmers within the University community and were bagged for 48 hours before mixing with concentrates. The *Moringaoleifera* leaves used in this experiment were harvested from trees within the University vicinity and were fed as fresh to the animals with concentrates.

Experimental Diets

The three breeds of pigs namely: Large white, Landrace and Duroc were fed on formulated diet containing 10% cassava peels and 25% fresh *Moringaoleifera* leaves.

Table 1: Proportion of ingredients used for the experimental diet.

Feed ingredients	Proportions %
Wheat offal	30
Rice bran	10
Cassava peeling	10
Soya bean meal	12.7
Palm Kerneal cake	12
Moringaoleifera leaves	25
Salt	0.3
Total	100

Experimental Animals and their Management

A total of sixty (60) weaners pigs of equal age was purchased. On arrival the pigs were randomly assigned into 3 breed treatment with two replicate each. Each replicate will have a total of 10 pigs. The animals were fed the experimental diet throughout the experimental period. The animals were given one week to acclimatize and were treated against internal and external parasites. Daily maintenance of the animals such as feeding and proper cleaning of the pigs pen was strictly carried out throughout the eight (8) weeks of the experiment.

Data Collection

The data on feed intake (feed consumption) were collected daily by subtracting the feed given from the feed leftover and the data on live weight changes was collected on weekly basis. All the data collected were subjected to statistical analyzing using regression analysis. Means were separate using the Duncan Multiple Range Test.

RESULTS

From the result in Table 2, feed intake show significant differences ($p < 0.05$) across the three breed of pigs $P < 0.05$. The Duroc breed of pig shows the lowest feed intake 131.84g while the highest feed intake was recorded in large white breed of pig with a value of 132.70g

Weight gained by weanerpig show that there was no significant difference ($P > 0.05$) at the end of the experimental period. The lowest weight gained (8.80kg) in value was recorded in Duroc breed but not significantly different when compare to other breeds of pigs.

The Feed Conversion Ratio shows that there was no significant difference ($P > 0.05$) across the three breeds of pig. The lowest value was observed in large white (16.40) compare to other breeds of pig, with Duroc breed having the highest value 19.38.

Table 2: Comparative Analysis, of the Growth Performance of Weaner Pigs Fed with *Moringaoleifera* and cassava peels

PARAMETER	Landrace	Large white	Duroc
Initial Weight at 4 weeks (kg)	8.53 ± 0.27 ^b	8.65 ± 0.13 ^a	8.61 ± 0.24 ^c
Final Weight at 8 weeks (kg)	16.94 ± 0.63 ^{ab}	18.16 ± 0.33 ^a	15.75 ± 0.56 ^b
Total weight gain (kg)	9.64±0.64	9.41±0.34	8.80±0.51
Total feed intake (g/pig)	132.47 ±0.12 ^a	132.70 ± 0. 88 ^a	131.84 ± 0.06 ^b
Feed conversion ratio(g : g)	18.55±0.25	16.40±0.32	19.38±0.45

a,b,c: Mean on the same row with same superscript are significantly different

From the Table 3 it is observed that at four weeks, the body weight of the three breeds of pigs ranges from 2.12 – 7.18 with the highest and lowest recorded for Large white and Duroc breeds respectively. Ham length recorded ranges from 0.08 – 0.30, Duroc breed of pigs shows better mean value of 0.30 compare to the others. The body girth and head length recorded shows that Landrace was the highest compare to the three breeds with mean value of 0.19 and 0.18 respectively. Body length and Ear length of pigs fed *Moringaoleifera* and cassava peels

a shows better growth pattern for Duroc breeds compare to the other breeds of pigs.

At eight weeks of the experiment large white shows better body weight of 28.30 compare to the other breeds of pigs with Duroc having the lowest mean value. Duroc breed has higher ham length mean value of 0.35 compare to the other treatments. Body girth and head length mean values was the highest in landrace breeds with the Duroc showing the lowest mean value for body girth and large white breed respectively.

Table 3: Regression equation relating body weight and linear body measurements at 4 and 8 weeks of age of three genotype/strains of grower pigs.

Genotype	Age	Prediction equation	R ²	SEM	SIG
Landrace	BDwt ₄ =	-4.14-0.08HML+0.19BG+0.05BL+0.18HL+0.25HS-0.30EL	70	1.05	NS
	BDwt ₈ =	-32.11-0.44HML+0.45BG+0.24BL+0.84HL-0.15HS+0.22EL	53	3.30	**
Large white	BDwt ₄ =	7.18-0.15HML+0.01BG+0.05BL+0.06HL+0.09HS-0.01EL	49	0.72	**
	BDwt ₈ =	28.30+0.35HML+0.01BG+0.05BL-0.28HL-0.42HS-0.48EL	56	1.59	NS
Duroc	BDwt ₄ =	-2.12+0.30HML+0.13BG+0.06BL+0.17HL-0.07HS-0.47EL	59	1.16	**
	BDwt ₈ =	-3.60-0.14HML-0.06BG+0.30BL+0.43HL+0.05HS-0.11EL	50	3.11	NS

SIG. **= Significant, BDwt₄ BDwt₈=Body weight at 4 and 8 weeks of age, respectively; HML= Ham length; BG= Body girth, BL=Body length; HL=Head length; HS= Hind shank, EL= Ear length; R²= Coefficient of multiple determinant, NS,= Not Significant, SEM=Standard error of the mean p<0.05

DISCUSSION

Performance of Weaner Pigs

The growth means performance of the weaner pigs as measured with feed intake, weight gain and feed conversion ratio, are reported in Table 1. It was revealed that there is a significant difference (P<0.05) in the food intake of the pigs fed with *Moringaoleifera* and cassava peels but there was no significant different (P>0.05) in the weight gain and the feed conversion ratio of the pigs observed across the three breeds of pigs. The non-significant differences observed in the weight gain and feed conversion ratio of the pigs indicates that they respond similarly to the diet.

The higher body weight in landrace breed of pigs fed with the same diet can be as a result of the high protein content in diet and it was able to convert the diet to body weight. On the other hand, a higher feed conversion ratio was observed in the pigs fed with the sundried diet. The high feed conversion ratio can be attributed to the low fiber observed in sundried

diet than the other diet. According to Onyimonyi, (2009), monogastric animals have little capacity to digest fibre and this can be the reason while there was a high feed conversion ratio in the diet of the three pigs.

Regression equation relating body weight and linear body measurements of grower pigs.

Ham length recorded ranges from 0.08 – 0.30, Duroc breed of pigs shows better mean value of 0.30 compare to the others. The body girth and head length recorded shows that Landrace was the highest compare to the three breeds with mean value of 0.19 and 0.18 respectively. Body length and Ear length of pigs fed *Moringaoleifera* shows better growth pattern for Duroc breeds compare to the other breeds of pigs. However, discrepancies observed in the results when compared to the present study is that of small scale production were managerial principles (feeding pattern and breeds of pigs) by farmers on the pigs, kitchen dumps and forages and peels of root crops are fed as feeds to pigs just to reduced production

cost. (Katongole *et al* 2012; Tatwangire, 2013). At eight weeks of the experiment large white shows better body weight of 28.30 compare to the other breeds of pigs with Duroc having the lowest mean value. Duroc breed has higher ham length mean value of 0.35 compare to the other treatments. Body girth and head length mean values was the highest in landrace breeds with the Duroc showing the lowest mean value for body girth and large white breed respectively. The current weight of pigs in this study was not significantly affected by the breeds of pigs which is in line with previous research (McLaren *et al* 1987). It has been established that weight of pigs don't affect the carcass yields and meat quality in general (Edwards *et al* 2003). The lack of breed significance could be a result of the fact that the genetic potential from the improved group animals is not that high and that the feeding regimes do not allow improved animals to express their potential. Most farmers mate their gilts or sows with any readily available boars from the neighborhood. This is attributed to the fact that all the pigs involved in the Murillo and Valdez, (2004) study were from improved breeds (three way crosses from purebred Landrace, Large White and Duroc), that were raised under confinement conditions and had ad libitum access to a diet that more closely matched its nutritional needs (NRC, 2012) when compared to the present study.

CONCLUSION

This study revealed that the performance of weaner pigs fed *Moringaoleifera* and cassava peels as feed supplements showed the inherent potential of the combination to improve the performance characteristic of pigs.

RECOMMENDATIONS

From the results of this study, it is recommended that pig farmers can use *Moringaoleifera* and cassava peels as feed supplements in feeding pigs. Further research should be carried out on the nutrient digestibility of pigs fed *Moringaoleifera* and cassava peels.

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