

# Effects of Housing Modifications on the Management of Pigs and Growth Performance

Akinlabi, E.Y<sup>1</sup>; Olusegun, O.B<sup>2</sup>; Owolabi O.T.<sup>3</sup>; Idowu A.O.<sup>4</sup>

<sup>1</sup>Department of Animal Health and Production Technology, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria.

<sup>2</sup>Department of Animal Health and Production Technology, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria.

<sup>3</sup>Department of Animal Health and Production Technology, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria.

<sup>4</sup>Department of Veterinary Medicine University of Ibadan, Ibadan

Corresponding author: Akinlabi, E.Y

Department of Animal Health and Production Technology, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria.

+2348131204173

**Abstract**— Pig industry in Nigeria is an important arm of the livestock sub-sector in the overall agricultural sector. The comfort of Pigs is determined by effective environmental temperature. It combines the effect of air temperature, flooring, and bedding. The aim of this study is to investigate the impact of different intensive housing systems on the feed consumption level, weight gain and welfare of pigs fed with the same feed (diet) under different housing systems for 8 weeks. Nine Pigs were purchased from a reputable commercial farm and were divided into 3 treatment groups, T<sub>1</sub>, T<sub>2</sub> and T<sub>3</sub>. T<sub>1</sub> is a well built pen with cemented wall and floor. T<sub>2</sub> is a pen built with bamboo wall, and cemented floor. T<sub>3</sub> is built with bamboo wall without cemented floor – bare loamy soil. The Pigs were raised for eight weeks. The feed given and weight gained for eight weeks were recorded and analysed using ANOVA. Considering the consumption levels of all treatments, T<sub>2</sub> had the lowest feed intake compared to other treatments. T<sub>2</sub> had the highest weight gain while T<sub>3</sub> had the lowest. It is hereby concluded that T<sub>3</sub> presented the best result as regards feed consumption, cost of construction and ease of management. Although it presented the lowest weight gain which is attributable to the initial weight and tipping of the feed trough (feed wastage). However, feed wastage can be minimized by using firmer feed trough.

**Keywords**— Pigs, ANOVA, Nigeria.

## I. BACKGROUND

With ever increasing human population in Nigeria and virtually static agricultural productivity, animal protein consumption among Nigerians has worsened in the past few years (Okpor, 2009). Many Nigerians feed on carbohydrate, this is because the average man cannot afford the cost of animal protein which is richer in amino acid. The deficiency

of animal protein in the diet of so many people is often attributed to the low number of livestock (Cattle, Pigs, Poultry, Goats, Sheep and their products), and the activities connected with their production which are not efficient (Morrison, 2001). Ugwu (2006) observed that animal protein apart from its palatability is essential for normal physical and mental development of man. He stated that its deficiency in the diet exerts adverse effect in terms of reduced human productivity due to abnormal development. Equally, he noted that animal protein and energy deficiency causes high incidence of infant mortality, pronounced malnutrition and diseases.

Pig production has been ticked as a panacea to protein inadequacy due to certain attributes which Pigs possess that are absent in other domestic livestock.

According to FAO (2001), pork is believed to be the most popular meat consumed in the world today. Forty four percent of world meat consumption is derived from pork and pork products (FAO, 2001).

Livestock production in Nigeria is carried out under different systems broadly classified as extensive, semi intensive and intensive. The extensive system can also be called the free range system, the animal roam and look for food. It is unspecialized and traditional system which is predominant among small scale farmers. While this may be the cheapest system of production, it also has the highest disadvantages ranging from theft to parasitic infections which render pork gotten from this housing system unwholesome for human consumption when subjected to veterinary inspection.

The semi intensive system gives room for good control of feeding, proper management and animals are more protected under this system than the free range.

Under the intensive production system, animals are raised in total confinement and this system enables them to fully express their genetic potentials. Adequate nutrients are provided; this helps in satisfying dietary requirement which culminate in efficient feed conversion and growth (Devandra and Fuller 1989). This system has a lot of advantages over the extensive and semi intensive system in terms of disease and breeding control as well as adoption of improved technology in animal production. This system prevents reckless grazing, destruction of farm crops and curbs animals from becoming nuisance on the street.

Pig industry in Nigeria is an important arm of the livestock sub-sector in the overall agricultural sector. This assertion is derived from the fact that Pig production, among other species has a high potential to contribute to high economic gain in three ways.

First, Pigs have high fecundity, high feed conversion efficiency, early maturity, short generation interval and relatively small space requirement.

Second, they are multipurpose animals providing about 40% of cooking fat, bristles and meat in the world market. Pig is equally important for agro-based industries like feed mills. They provide bone and blood which are used for production of bone meal and blood meal. This is a good source of calcium in animal nutrition. In addition, pig manure is an excellent fertilizer for enriching, replenishing poor soils and provision of biogas. Pig skin is also useful for light leather production (Babatunde & Fetuga, 1990).

Third, it is produced under varieties of production systems ranging from simple backyard piggery to large scale integrated Pig industries with sophisticated bio-safety measures.

The comfort of Pigs is determined by effective environmental temperature which combines the effect of air temperature, flooring and bedding.

The aim of this study is to investigate the impact of different intensive housing systems on feed consumption level, weight gain and welfare of Pigs fed with the same feed (diet) under different housing systems for 8 weeks.

## II. METHODOLOGY

### Location of the experimental site

The experiment commenced on 10<sup>th</sup> of May, 2016. Nine (9) Pigs (crosses of large white and land race) were allotted into 3 housing systems. This project work lasted for 8 weeks and was terminated on 5<sup>th</sup> of July, 2016. This research was conducted at the piggery unit of Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria.

### Experimental design

Three housing systems were studied, which are; T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>. Nine (9) Pigs (crosses of large white and land race) were purchased from a reputable commercial farm and were raised for eight weeks. The three treatments have different housing systems:

T<sub>1</sub>: This is a well built pen with cemented walls and floor.

T<sub>2</sub>: This is a well built pen with bamboo walls, and cemented floor.

T<sub>3</sub>: This is a well built pen with bamboo walls without cemented floor – bare loamy soil. Each treatment has three replicates, and each replicate contained one animal.

### Experimental procedure

#### Daily Routine

The daily routine practice in the farm includes; cleaning of pen and its surrounding, washing the drinking trough and cleaning the feeders. Feed and water were given to them throughout the experiment. The weight of the feed leftover as well as feed intake was recorded.

#### Occasional Routine

All through the period of this research, Pigs were weighed on weekly basis.

## III. RESULTS AND DISCUSSION

Table.4.1: Feed Consumption Level

Parameter	Treatment 1	Treatment 2	Treatment 3
<b>Feed intake</b>	569.86±225.36 <sup>a</sup>	562.98±209.08 <sup>a</sup>	602.41±222.45 <sup>a</sup>
<b>Leftovers</b>	68.51±73.11 <sup>b</sup>	102.38±91.91 <sup>a</sup>	57.23±64.15 <sup>b</sup>
<b>Feed given</b>	740.00±111.24 <sup>a</sup>	740.00±111.24 <sup>a</sup>	736.10 <sup>a</sup> (109.70)

Table.4.2: Weight Gain

Treatment	Weight gain (Mean±SD)
Treatment 1	9.92±2.35 <sup>a</sup>
Treatment 2	9.97±1.58 <sup>a</sup>
Treatment 3	9.69±1.90 <sup>a</sup>

Table.4.3: Classification of housing parameters, general pig management and health parameters

Parameter	Treatment 1	Treatment 2	Treatment 3
Construction type	Asbestos roof, well cemented walls and floor	Asbestos roof, bamboo walls and cemented floor	Asbestos roof, bamboo walls and non-cemented floor
Ease of management	Difficult to clean because it is tedious to wash the floor and wall stained with faeces.	Less difficult because it is needless to wash the wall.	It is the easiest to clean. The floor can easily be swept without been washed.
Ease of effluent disposal	Easy	Difficult	More difficult
Pig general outward appearance	Often clean	Partially clean	Often dirty
Skin lesion	Abundance of mange on the back	Few mange on the back	Absence of mange on the animal
Floor condition	Often dry	Occasionally dry	Mostly wet
Labour	Highly Intensive	Moderately Intensive	Least Intensive

The result shown above reveals housing parameters, general pig management and health parameters.

Considering the construction type, Treatment 1 has Asbestos roof, well cemented wall and floor. Treatment 2 has an Asbestos roof, bamboo fence, and cemented floor, while Treatment 3 has an Asbestos roof, bamboo fence and non-cemented floor. This shows that Treatment 3 is the cheapest housing system.

Considering ease of management, Treatment 1 is difficult to clean and takes time, because it involves sweeping and washing of the floor as well as cleaning of the walls. Treatment 2 is less difficult because it only involves sweeping and washing of the floor, without cleaning of the walls. Treatment 3 is the easiest to clean because it only involves sweeping of the floor.

Considering skin lesion, Pigs in treatment 1 were affected by mange (at the back), and Pigs in treatment 2 were mildly affected by mange, while Pigs in treatment 3 were not affected at all.

Considering ease of effluent disposal, effluent in Treatment 1 is the easiest to dispose because of the construction style which enhances proper disposal. It is mildly difficult to pack and dispose effluent in Treatment 2, while effluent in Treatment 3 is extremely difficult to dispose.

Considering general outward appearance, Pigs in Treatment 1 were the cleanest because they were placed on cemented floor. Pigs in Treatment 2 were partially clean, while Pigs in Treatment 3 were extremely dirty because they were placed on non cemented floor.

Considering floor condition, it was observed that the floor condition was often dry due to clean floor in Treatment 1. In Treatment 2, the floor condition is occasionally dry, while Treatment 3 is often wet because the animals often tip the watering trough; therefore, the floor is often wet.

Considering labour intensity, Treatment 1 was the highest because it is a well built pen. Therefore, it requires thorough cleaning and hygiene. Treatment 2 was moderately intensive because it was a partially built pen with bamboo

walls which doesn't require cleaning. Treatment 3 has the lowest labour intensity because both walls and floor were not cemented.

Table 4.1 reveals the consumption levels of the treatments. Treatment 2 had the lowest feed intake compared to other treatments. Although the differences between treatments were statistically insignificant, this may be as a result of housing modification which was not conducive for pigs in Treatment 2, thereby reducing feed intake (Ugwu, 2006). Treatment 3 has the highest feed intake and this may be as a result of access to available nutrients in the soil which could have enhanced their appetite.

Table 4.2 reveals the weight gain for each treatment. Treatment 2 had the highest weight gain while treatment 3 had the lowest. The observation above maybe due to the difference in the initial weight of the experimental animals.

#### IV. CONCLUSION

It is hereby concluded that treatment 3 presented the best result as regards feed consumption, cost of construction and ease of management. Although, Treatment 3 presented the lowest weight gain which could be as a result of the initial weight, tipping of the feed trough (feed wastage). However, feed wastage can be minimized by using firmer feed trough.

#### RECOMMENDATION

It is therefore recommended that farmers can incorporate this experimented low cost housing system. Sanitation, hygiene and good general management practice must be efficiently implemented in order to make it a productive housing system.

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