

COMPARATIVE EVALUATION OF THE PERFORMANCE OF CROSSBRED WEANED PIGS ON CONCRETE, SLATTED AND STRAW FLOORS

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ABSTRACT

In order to ensure sustainable pig production in most tropical countries, alternative flooring systems need to be investigated and adopted. Thus, this research aimed to investigate the effect of three type of floors (concrete, straw and slatted) on the performance characteristics of crossbred weaned pigs. Eighteen crossbred weaned pigs were obtained from the piggery unit of Teaching and Research farm of Oyo State College of Agriculture and Technology, Igboora. The concrete floors were constructed using cement, gravel, sand and water. The straw floor were made of maize stalk, and slatted floor were made of wooden plank. The crossbred weaned pigs were allotted into three treatments of six (6) animals per replicate. The experiment lasted for eight weeks. Data obtained were arranged in a Completely Randomized Design (CRD) and analyzed by Analysis of Variance. Data obtained showed significant ($P<0.05$) difference in the final live weight of pig across the treatments with the highest live weight 21.08 ± 3.64^a recorded for pig in treatment 3 (slatted floor), while the least final live weight 14.17 ± 0.58^b was observed for pig in treatment 2 (straw floor). The final live weight of pig raised on concrete floor 16.03 ± 0.14^{ab} was similar ($P>0.05$) to the final live weight 21.08 ± 3.64^a of pig raised on slatted floor. The feed conversion ratio showed significant ($P<0.05$) difference across the treatment with the best result 1.89^a obtained in pig raised on slatted floor. The feed conversion ratio showed significant ($P<0.05$) difference across the treatment. It could be concluded that the weaned pig raised on slatted floor recorded the best result.

Keywords: Beddings, concrete, slatted, straw, floor, weaned pig

INTRODUCTION

Experts on pig welfare assign considerable importance to the availability of a substrate such as straw in their welfare assessments of housing system (Spooler *et al.*, 2003). Enrichment and flooring are important factors affecting the incidence of injuries and stomach ulcers in pigs. In pig farming, welfare conditions should be observed at critical stages such as weaning, when piglet performance may be affected by behavioural, physiological, immunological and microbiological changes (Molino and Balbino, 2010). Environmental enrichment by provision of objects or substrates capable of satisfying the behavioural needs of pigs is a major approach to combat animal welfare problems. The effects of enrichment can be examined in different approaches such as behavior and performance of pigs in enriched environments compared to those in barren environments. The use of deep beddings in pig production has been increasing as it facilitates and reduces the cost of waste management, it improves the physical comfort of the floor and it as crucial motivation and outlet for exploration behaviours (Tuytens, 2005). Several bedding materials and their depth used in piggeries have been studied such as rice husk, wood shavings, barley and wheat straw (Morrison *et al.*, 2003). Maize being an important and staple food in Nigeria, its availability all the year round and ease access as crop residues necessitate the choice of maize straw for this study. The selection of the deep bedding material is clearly a decision-making multi-criteria task as it involved different aspects related to animal benefit, farmer's financial advantage and availability and price of the material. The performance of pig is crucial as it reflects their response particularly to feed given and their living environment. Hence, this study was conducted to compare the growth performance of crossbred weaned pigs reared on concrete, slatted and straw floors.

MATERIALS AND METHODS

The experiment was carried out at the piggery unit of the Teaching and Research Farm of the Oyo State College of Agriculture and Technology, Igboora, Nigeria. The experimental area lies in Savannah forest zone at latitude $7^{\circ}43'0''N$ and longitude $3^{\circ}28'0''E$ in an elevation of 140m above sea

level. The average minimum temperature is above 21.5^oc and maximum average temperature is about 32.5^oc. Eighteen (18) crossbred (Largewhite x Landrace) weaned pigs at eight weeks of age were purchased from the piggery unit of the Oyo State College of Agriculture and Technology, Igboora. The pigs were dewormed and fed 4% of their body weight as daily feed at the beginning of the experiment and this increased in relation to their weight as they grew while water was supplied *ad libitum*. The pigs were allowed one week acclimatization and the animals were fed twice daily at 7.00am and 4.00pm. The experiment lasted for eight weeks. The experimental diet was formulated to meet the nutritional requirements of the animals. Three pens was constructed using wooden plank and the roofing was made of iron sheet. The floors were made of concrete, straw and slatted. The concrete floors were constructed using cement, gravel, sand and water while the straw floor was made of maize stalk. Slatted floor with a slatted gutter at the lower end were constructed. The pigs fed and rested on the slatted floor and the slatted floor over the gutter was utilized as the dunging area. The pens were cleared daily by washing down the floor with broom, water and manure were collected in the gutter and flushed into a pit. The pigs were housed in the pens equipped with individuals drinking and feeding facilities, the pen used were constructed with wooden planks in an open sided gable roof building. One kilogram straw was placed in each pen before the arrival of the pigs. Additional supply 1 kg straw was offered every two days. Waste straw and manure were removed daily. Data was recorded on daily and weekly basis on the performance of pigs for feed intake and body weight respectively. The data on feed intake and body weight were evaluated such that feeding was offered at 4% body weight for each replicates. The leftover feed after each day's meal, was collected, weighed and recorded for each replicates on daily basis. Feed consumption for each day was obtained from the differences, between feed given per day and left over,

Total feed intake (kg) = total feed given (kg) – total feed leftover (kg)

Average feed intake (g) =
$$\frac{\text{Total feed intake (kg)}}{\text{Total number of the day of experiment}}$$

Pigs in each replicates were weighed and recorded at the start of the experiment and the weighed at the end of each week for 4 weeks of the experiment. Final weights were taken and recorded at the end of the experiment. The experimental animals were randomly allotted to three treatments consisting of 6 animals per treatments in a completely randomized design, each treatment was replicated three times with two animals per replicate. Experimental design used was complete randomized design (CRD). The average weekly weight gain, final weight gain, total feed consumed and feed conversion ratio (FCR), were compared by one factor analysis of variance program of SAS (2012), the difference between the treatments means were examined by Duncan multiple range test of SAS (2012).

Table 1: Comparative evaluation of crossbred weaned pig on concrete, straw and slatted floors

Parameters	T1 (Concrete)	T2 (Straw)	T3 (Slatted)
Initial weight (kg)	11.00±0.00 ^b	11.27±0.58 ^b	11.34±2.29 ^a
Final weight (kg)	16.83±0.14 ^{ab}	14.17±0.58 ^b	21.08±3.64 ^a
Average weight gain (kg)	5.83±0.14 ^{ab}	4.50±0.0 ^b	7.08±1.91 ^a
Weekly weight gain (kg)	0.73±0.02 ^{ab}	0.56±0.00 ^b	0.89±0.24 ^a
Daily weight gain (kg)	0.10±0.00 ^{ab}	0.08±0.00 ^b	0.13±0.03 ^a
Feed intake Kg)	7.75	7.75	7.75
FCR	2.26 ^b	2.69 ^c	1.89 ^a

^{a,b,c} means on the same rows with different superscript differ significantly)P<0.05)

FCR = Feed Conversion Ratio

RESULTS AND DISCUSSION

Data obtained showed significant (P<0.05) difference in the final live weight of pigs across the treatments with the highest live weight 21.08±3.64^a recorded for pig in T3 (slatted floor) while the least 14.17±0.58^b was observed for pig in T2 (straw floor). The final live weight of pig raised on concrete floor 16.03±0.14^{ab} was similar (P>0.05) to 21.08±3.64^a observed for pig on slatted floor. The poor final live weight of pig raised on straw floor could be attributed to high feeding motivation in the pigs and this must have affected their feed intake leading to increase in sleeping behavior since they have no engage in activities relating to scavenging. Excessive temperature as a result of fermentation of the substrate could result in heat stress reducing voluntary feed intake and weight gain of pigs

(Quiniou *et al.*, 2000). The values obtained from average weight gain showed significant ($P<0.05$) difference across the treatments. The lowest average weight gain 4.50 ± 0.00^b was observed in weaned pig raised on straw floor while the highest value 7.08 ± 1.91^a was recorded in weaned pig raised on slatted floor. The values obtained from weekly weight gain showed significant ($P<0.05$) difference across the treatments. The lowest weekly weight gain 0.56 ± 0.00^b was observed in pig raised on straw floor while the highest value 0.89 ± 0.24^a was recorded in weaned pig raised on slatted floor. The values obtained from daily weight gain showed significant ($P<0.05$) difference across the treatments. The lowest weekly weight gain 0.08 ± 0.00^b was observed in weaned pig raised on straw floor while the highest value 0.13 ± 0.03^a was recorded in pig raised on slatted floor. Maize being an important and staple food in Nigeria, its availability all the year round and easy access as crop residues necessitate the choice of maize straw for this study. Feed conversion ratio showed significant ($P<0.05$) difference across the treatment with the best result 1.89^a obtained in weaned pig raised on slatted floor. The performance of pigs is crucial as it reflects their response particularly to feed given and their living environment.

CONCLUSION

Better pig production performance with improved weight changes and feed conversion ratio was noted with pigs on slatted floor. It is therefore, concluded that pig raised on slatted floor promote better pig welfare.

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