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308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorpjn@gmail.com

Performance and Linear Measurements of Growing Pigs Fed on Basis of Their Body Weight

A.E. Onyimonyi, S.O.C. Ugwu and N.S. Machebe
Department of Animal Science, University of Nigeria, Nsukka, Nigeria

Abstract: The performance of growing pigs fed on basis of percentage of their body weight was evaluated using twenty four growing pigs of Landrace x Large White crosses weighing averagely 35 ± 0.5 kg at the start of the study. The pigs were assigned to four treatments and each treatment was replicated thrice with two pigs per replicate in a Completely Randomized Design. An 18% CP and 11.82 MJME/kg diet was formulated and fed at levels of 10, 8, 6 and 4% of body weights in treatments 1, 2, 3 and 4 respectively. The feeding trial lasted for 56 days. Results showed that treatment effect on the response parameters were significant ($P < 0.05$). As percentage of body weight feeding reduced, final body weight of the pigs increased significantly ($P < 0.05$). Pigs on treatments 2, 3 and 4 had a final body weight of 68.64, 67.62, 67.68 kg respectively which differed from the 60.03 kg observed for pigs on treatment 1. Pigs fed 4% of their body weight (Treatment 4) showed superiority in the response parameters. Pigs on Treatment 4 had a feed cost/kg gain value of 79.56 naira which differed significantly from 263.21 naira, 161.78 naira and 120.67 naira recorded for pigs on T_1 , T_2 and T_3 respectively. Linear body measurement of the pigs followed the same trend as observed in the other response parameters. Pigs on T_4 recorded the highest significant ($P < 0.05$) changes in chest girth, height at withers and body length. It is concluded that feeding growing pigs at level of 4% of their body weight leads to optimum performance and better economic returns.

Key words: Performance, linear measurements, pigs

INTRODUCTION

The increases in the prices of feedstuffs have made many pig farmers in Nigeria to embark on indiscriminate feeding of their animals with poor quality feeds. Often garbages form the bulk of ration for these animals. The antecedent impact on the animal is a drastic reduction in growth and reproductive performances. Pigs reared in this manner often take a longer time to reach market weight. What most pig farmers do not realize is that they can feed their pigs with balanced ration using a feeding module based on the body weight of the pigs and still attain recommended market weight faster. Barber *et al.* (1972) had earlier described a feeding module for pigs based on their body weight. The authors observed that although pigs fed on semi-*ad libitum* level grew faster than pigs on scale feeding, the feed to gain ratio of the two groups were not significant. Onyimonyi and Okeke (2007) reported that weaner pigs can be fed on basis of 4% of their body weight without compromising performance. Some authors had equally utilized *ad libitum* feeding module for pigs (Ayuk *et al.*, 2008; Olowofeso, 2002). Linear body measurement such as chest girth, heart at withers and body length are used to relate body dimensions to an animals overall body size or weight. These measurements are frequently used in studies of an animal growth. Sulabo *et al.* (2006) established that there is a positive correlation between linear measurements and body weight in pigs. Brown *et al.* (1973) observed that linear body measurements can be used in assessing growth rate, weight, feed

utilization and carcass characteristic in farm animals. According to Tegbe and Olurunju (1988) and Oke *et al.* (2006), changes in linear measurements are an indication of tissue growth evidenced in the muscle and fat tissues. These parameters tend to increase as the animal grows over time.

The present work was designed to investigate the performance and some linear body measurements of grower pigs subjected to a feeding module based on their body weight.

MATERIALS AND METHODS

This study was conducted at the Pig unit of the Department of Animal Science Teaching and Research Farm, University of Nigeria, Nsukka. Twenty four growing pigs of Landrace x Large White crosses weighing 35 ± 0.5 kg were used for the study. The pigs were assigned to four treatments and each treatment was replicated thrice with two pigs per replicate in a Completely Randomized Design (CRD). Each replicate were housed in an open sided pen measuring 3.2 x 2.75 m. Each pen had inbuilt concrete water and feed troughs. An 18% CP and 11.82MJME/kg diet was formulated and fed to the treatments as follows:

Treatment 1	:	10% of body weight
Treatment 2	:	8% of body weight
Treatment 3	:	6% of body weight
Treatment 4	:	4% of body weight

Table 1: Percentage composition of the grower ration

Ingredients	Quantity (%)
Maize	7
Cassava chips	25
Palm kernel cake	21
Brewers spent grain	30
Groundnut cake	12
Bone meal	2.30
Vitamin mineral premix*	0.25
Lysine	0.10
Methionine	0.10
Common salt	0.25
Total	100
Calculated	
Crude protein	18.06
Energy (MJME/kg)	11.36

*Supplied vitamin A (15,00,000, iμ), vitamin D₃ (3,000,000), vitamin E (30,00 iμ), vitamin K (2, 500 iμ), Thiamin (2,000 mg), Riboflavin (600 mg), Pyridoxine (4000 mg), folic Acid (1000 mg), Biotin (80 mg), chlorine chlonde (500 mg), Manganese (96 g), Zinc (60 g), Iron (24 g), copper (6 g), Iodine (1.4 g), Selenium (24 g), cobalt (12 g), Antioxidant (12 g) per tonne of feed

The feeding trial lasted for 56 days. The initial body weights of the pigs were taken on day 1 of the trial and subsequently on weekly basis. Feed intake record was taken on daily basis. Feed conversion ratio was calculated as ratio of feed/gain. Feed cost/kg gain was computed as the feed cost/kg of feed multiplied by the feed conversion ratio. Weekly measurements of chest girth (cm), height at withers (cm) and body length were taken as earlier described by Onyimonyi (2002).

Data collected were processed and analyzed using the analysis of variance method as outlined by Steel and Torrie (1980). Significantly different means were separated by methods of Duncan's New Multiple Range Test, Duncan (1955).

RESULTS AND DISCUSSION

Results of the performance of the pigs used in this study are presented in Table 2. Results showed that as the percentage of body weight feeding reduced, final body weight of the pigs increased significantly ($P < 0.05$). Pigs on T₁ had a final body weight of 60.03 kg which differed significantly from a value of 68.64, 67.62 and 67.68 kg recorded for pigs on T₂, T₃ and T₄ respectively. Final body weights of the pigs on T₂, T₃, and T₄ were statistically the same ($P > 0.05$). However, pigs on T₂ had the highest

numerical final body weight of 68.64 kg. Body weight gain and average daily gain values followed the same trend as final body weight. The effect of treatments on average daily feed intake and feed conversion ratio were significantly different ($P < 0.05$) for all the treatments. Pigs on T₄ had the least average daily feed intake ADFI of 1.40 kg which was significantly different from the values of 3.52, 2.87 and 2.11 observed for pigs on T₁, T₂ and T₃ respectively. The same pigs on T₄ had the best FCR of 2.40 which also differed significantly ($P < 0.05$) from 7.94, 4.88 and 3.64 observed for pigs on T₁, T₂ and T₃ respectively. Feeding pigs at 4% of their body weight (T₄) also lead to a significant reduction in feed cost/kg gain. Pigs at this level of feeding have a feed cost/kg gain value of 79.56 naira which differed significantly ($P < 0.05$) from 263.21 naira, 161.78 naira and 120.67 naira observed for pigs on T₁, T₂ and T₃ respectively. Feed cost/kg gain is a product of feed conversion ratio and feed cost/kg. A feeding regime that enhances better feed utilization will consequently result in better growth and economic performance. This agrees with the earlier view of Fetuga *et al.* (1975) that efficiency of feed conversion in pigs is inversely related to increased feed intake because higher intake allows for increased body fat deposition and body fat deposition requires more energy and protein for the same unit increase in body weight. The superiority of pigs on T₄ further corroborates the report of Caspar (1994) that improvement of feed efficiency leads to a lower total cost of production keeping the feed cost constant and signifies a lower nutrient expenditure per unit of production.

Chest girth, height at withers and body length changes were significantly ($P < 0.05$) affected by treatments (Table 3). Pigs on treatment 4 recorded significantly ($P < 0.05$) higher changes in these linear measurements than pigs on the other treatments. Linear body measurements are useful predictors of body weight. This finding is in harmony with earlier view of Sulabo *et al.* (2006) and Brown *et al.* (1973). It also agrees with the view of Tegbe and Olurunju (1988) and Oke *et al.* (2006) that changes in linear body measurements are indications of tissue growth and tends to increase as the animal grows. The practical implication of the present study is that a farmer that feeds his growing pigs on 4% of their body weight will have the pigs reach desired market weight faster. Such a pig farmer will make more

Table 2: Performance of growing pigs fed on basis of percentages of body weight

Parameters	1	2	3	4	SEM
Initial body weight (kg/pig)	35.20	35.70	35.16	35.07	0.46
Final body weight (kg/pig)	60.03 ^b	68.64 ^a	67.62 ^a	67.68 ^a	0.49
Body weight gain (kg/pig)	24.83 ^b	32.94 ^a	32.46 ^a	32.61 ^a	0.09
Average daily gain (kg/pig/day)	0.44 ^b	0.59 ^a	0.58 ^a	0.59 ^a	0.15
Average daily feed intake (kg/pig/day)	3.52 ^a	2.87 ^b	2.11 ^c	1.40 ^d	1.08
Feed conversion ratio (feed/gain)	7.94 ^a	4.88 ^b	3.64 ^c	2.40 ^d	0.84
Feed cost/kg gain (naira)	263.21 ^a	161.78 ^b	120.67 ^c	79.56 ^d	4.39

^{abcd}Row means with different superscripts are significantly different ($P < 0.05$). SEM = Standard Error of Mean

Table 3: Linear body measurements of pigs fed on basis of percentage of body weight

Parameters	Treatments				SEM
	1	2	3	4	
Chest girth (cm)					
Initial	54.05	54.12	54.65	54.39	-
Final	62.30	63.70	64.79	67.70	0.35
Δ in chest girth	8.25 ^b	9.58 ^b	10.4 ^{ab}	13.31 ^a	1.71
Height withers (cm)					
Initial	48.62	48.51	48.11	48.23	-
Final	59.00	60.67	60.73	61.13	0.96
Δ in body length	10.38 ^b	12.16 ^a	12.82 ^a	12.91 ^a	1.25
Body length					
Initial	56.34	56.66	56.01	56.75	-
Final	76.47	82.67	86.73	87.93	0.56
Δ in body length	20.13 ^c	26.01 ^b	30.72 ^a	31.18 ^a	1.36
Δ change					

profit than pig farmers feeding at 10, 8 or 6% of body weight.

Conclusion: It is concluded that growing pigs in Nigeria should be fed 4% of their body weight for optimum performance, superior linear body measurement increases and better economic yields.

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