COMPARATIVE EVALUATION THE GROWTH RESPONSE OF GROWER PIGS FED DIETS CONTAINING SOYBEAN, GROUNDNUTS AND SUNFLOWER

Salami, O.M., Afolayan, M., Folorunso, A.M., Umar, S. and Musa, K.
Samaru College of Agriculture, Division of Agricultural Colleges, Ahmadu Bello University, Zaria
Corresponding Author e mail address: moji_afolayan@yahoo.com

ABSTRACT
The study investigates the response of grower pigs to diets containing different sources of protein specifically, soya cake, sunflower meal and groundnut cake. A total of Nine (9) grower pigs of average weight of and age were used for the study and were randomly allotted to three dietary treatments, with each group receiving a diet containing one of the protein sources. Parameters such as initial weight and final weight, daily weight gain, and feed intake were evaluated over a period of four weeks. The results showed that pigs fed with sunflower based diet had better final weight compared to those fed Soybean meal (14.33 and 13.00kg/head), however, average weight gain was significantly lower (5.5kg/head) for the pigs fed groundnut based diet when compared with the pigs fed diets containing Soybean and sunflower (7.50 and 7.17kg)respectively. Although, the diets were found to be nutritionally adequate for the growth of the pigs. However, the pig's sunflower-based diet had better feed conversion ratio and also diet containing sunflower meal had least cost (₦) per kg. In conclusion, sunflower meal could be used to replace Soybean meal and groundnut cake in the diets of grower pigs. These findings can be valuable for pig Farmers and Researchers looking to optimize the growth performance of their pigs through dietary choices.

Keywords: Pigs, Soya cake, Sunflower meal, Groundnut cake, Growth

INTRODUCTION

Due to the increase in the world's population and high demand for animal proteins, it has been predicted that pork consumption will increase by 105% between 2010 and 2050 (World livestock 2011). Soybean meal is the leading protein source in pig diets due to its superior quality and amino acid profile. Soybean has been reported to be the standard plant protein source in animal nutrition. Its widespread use in animal feed is due to its high digestibility and availability of essential nutrients (Ravindran, 2013). The protein quality is particularly notable because of the high levels of essential amino acids, such as lysine, which are often limited in other plant-based proteins (Arias *et al.*, 2011). This makes it an ideal choice for improving growth and muscle development in animals (Goldflus , 2006)

Sunflower Meal on the other hand is rich in protein, its amino acid profile is less favorable compared to soybean meal, particularly in terms of lysine content. Nonetheless, it is widely used in animal feeds, especially in regions where sunflower production is high (Bajic, 2020). Sunflower meal can replace soya up to 20% for cost effectiveness, however it is not advisable to include it in the young pig's diets due to the presence of phenolic compounds.

Groundnut cake has high protein contents of between 40-45% CP, making it an excellent source of protein for animal feed. The high protein content supports growth, muscle development, and overall health in livestock. This makes it a valuable component of many animal diets, particularly for ruminants, poultry, and pigs (Nwokolo, 1996; Hassan, 2005).

The inclusion of soya cake, sunflower meal and groundnut cake as source of protein in the diets of grower pigs was considered necessary in this study so as to evaluate the growth response of the pigs and determine a cheaper source of protein for pig production.

MATERIALS AND METHODS

The experiment was carried out at the pig unit of the Department of Animal Science Teaching and Research Farm, Ahmadu Bello University, Zaria. A total number of nine grower pigs with average weight of 7.25kg were randomly assigned into three treatments diets labeled T1, T2 and T3 respectively (Table 1). Each treatment was replicated thrice and were housed in individual pen. They were fed on the experimental diets for the period of 4 weeks. The initial weight of the pig was taken at the beginning of the experiment and subsequently on weekly basis. The daily feed supply was 5% of the body weight of the pigs. The experimental diets were offered in concrete feeders on daily basis and the feed leftover was also weighed and subtracted from the feed supply to obtain the daily feed intake. Water was also provided in water through and also a concrete wallowing spot was provided. Some of the parameters measured include total feed intake, total weight gain, feed conversion ratio and mortality.

Table 1: Gross Composition of the experimental diet

Ingredients (kg)	T1	T2	T3
Maize	30	30	30
Maize offal	23	23	23
Rice offal	30	30	30
Soya cake	15	0	0
Sunflower cake	0	15	0
Groundnut cake	0	0	15
Bone meal	1	1	1
Salt	0.25	0.25	0.25
Methionine	0.25	0.25	0.25
Lysine	0.25	0.25	0.25
Premix	0.25	0.25	0.25
Total	100	100	100
Calculated Nutrient Composition			
Cost/kg ₦	235	200	231
Me Kcals/kg	2387	2370	2361
Crude Protein (%)	13.30	13.00	13.28
Crude Fibre (%)	16.52	15.50	15.32
Lysine (%)	0.71	0.74	0.89
Methionine (%)	0.44	0.40	0.47

RESULTS AND DISCUSSION

Table 2: Growth performance of grower pigs fed diet containing dietary levels of soya beans cake, groundnut cake and sunflower seed cake.

Parameters (kg)	T1	T2	T3
Initial weight	5.50	7.16	6.83
Final weight	13.00	14.33	12.33
Total weight Gain	7.50	7.17	5.50
Total Feed Intake	17.75	15.75	17.00
Feed Conversion Ratio	2.37	2.20	3.09
Mortality	0.00	0.00	0.00

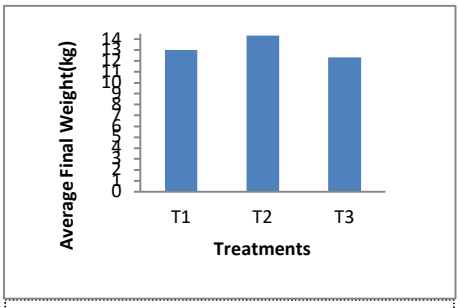


Figure 1: Effect of soya, sunflower and groundnut cake on the average final weight of grower pigs

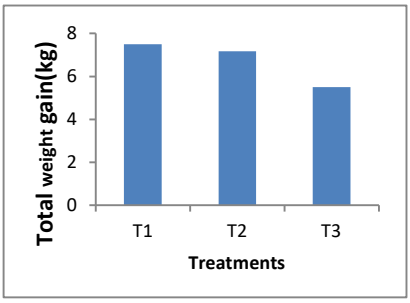


Figure 2: Effect of soya, sunflower and groundnut cake on the total weight gain of grower pigs

Growth response of grower pigs fed diets containing soya, sunflower and groundnut cake

The result of the Effect of soya, sunflower and groundnut cake on the average final weight and total weight gain of grower pigs is as shown in figures i and ii respectively. Pigs fed with sunflower based diet had better final weight compared to those fed Soybean meal (14.33 and 13.00kg/head), however, average weight gain was significantly lower (5.5kg/head) for the pigs fed groundnut based diet when compared with the pigs fed diets containing Soybean and sunflower (7.50 and 7.17kg) respectively.

Comparative analysis of the linear body measurement of the grower pigs fed containing soya cake, sunflower seed cake and groundnut cake

In figure iii, it was observed that the body length of the pigs that were fed on soya base diet increased linearly from week 1 to 4. This result is in line with Mattes and Dreher (2010) who said soya seeds are a good source of plant-based protein. Figure iv shows the body length measurement of the grower pigs fed on sunflower cake base diet. The result is comparable to that of the soya cake base diet. This implies that sunflower cake may be used to replace soya bean cake in the diet of grower pigs. This is in line with (López 2016). Who reported that sunflower meal can replace a portion of soybean meal, but the lower lysine content may necessitate additional supplementation to optimize growth. However, Sharp reduction in the body length was observed at week 3 as shown in figure v.

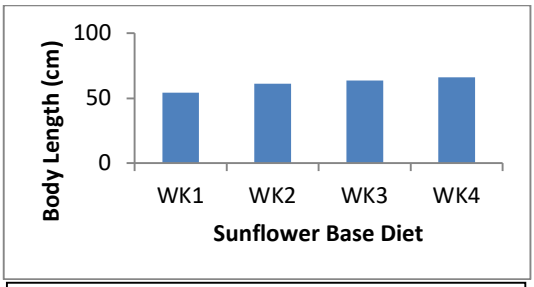


Figure 3: Effect of soya cake base diet on the body length

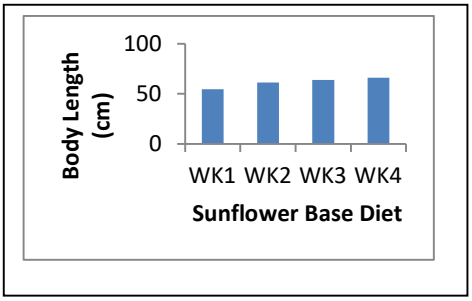


Figure 4: Effect of sunflower cake base diet on the body length

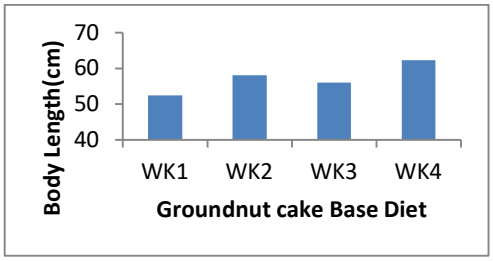


Figure 5: Effect of groundnut cake base diet on the body length

CONCLUSION:

Within the scope of this study, it was concluded that sunflower seed meal can be used to replace soyacake in the diet of grower pig because it gives better weight gain than soyacake and groundnut cake and also has a positive effect on the linear body measurement of the pigs. Feed conversion ratio which is a symbol of profit obtained by the farmers is better on sunflower cake diet followed by soyacake and then groundnut cake.

RECOMMENDATION:

Farmers may use sunflower meal to substitute for soya and groundnut cake in the diet of growing pigs.

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