

## Enhanced utilization of palm kernel cake as a feed resource for growing-finishing pigs using exogenous enzyme

A O K Adeshinwa<sup>1</sup>, A B Omojola<sup>2</sup>, M A Adesina<sup>2</sup>, O A Ladokun<sup>3</sup>

<sup>1</sup>Institute of Agricultural Research and Training, Obafemi Awolowo University, Ibadan, Oyo State, Nigeria, <sup>2</sup>Department of Animal Science, University of Ibadan, Ibadan, Oyo State, Nigeria, <sup>3</sup>University of Agriculture, Abeokuta, Ogun State, Nigeria.  
Email: aokadeshinwa@gmail.com

**Introduction** The scarcity of conventional feeds has hindered the growth and development of the livestock industry in Nigeria. The general shortage of energy and protein feeds appear to be more severe for non-ruminants that depend to a great extent on compounded feeds, especially pigs, which are bulk feeders. Palm kernel cake (a by-product of cottage Oil Palm - *Elaeis guineensis* processing industries in Nigeria) has since become an important feed ingredient. In view of severe constraint of the present high cost of feeding conventional energy and protein feedstuffs to pigs, increased utilization of PKC is inevitable. This has made a substantial contribution towards better and more economic feeding of non-ruminants. However, fibrousness is a feature of most locally available agro-industrial by-products and wastes which may limit their use and many enzymes have been found to be beneficial when added to non-ruminant animal diets containing carbohydrate or protein sources containing high levels of non-starch polysaccharides (Acamovic, 2001). Allzyme® Vegpro 5X is a combination of naturally-occurring enzymes - Protease, Cellulase, Pentosanase (Xylanase),  $\alpha$ -Galactosidase and Amylase (Allzyme, 2008) routinely used in poultry and pig feeds to improve the nutritive value of plant-based feeds (Campbell and Bedford, 1992). It was therefore the aim of this study to investigate the utilization of palm kernel cake-based diet supplemented with or without exogenous enzyme, Allzyme® Vegpro 5X by growing-finishing pigs.

**Materials and methods** Forty-five (45) crossbred grower pigs of 39.10±1.04 kg body weight were randomly allocated based on body weight, sex and litter origin in a completely randomised design to five experimental diets containing two levels of PKC: (1) 20% maize+3% FM+7% GNC+20% PKC-based control diet, (2) 20% maize+10% GNC +20% PKC-Enz, (3) 20% maize+10% GNC +20% PKC+Enz (Allzyme® Vegpro 5X), (4) 0% maize+10% GNC +40% PKC-Enz and (5) 0% maize+10% GNC +40% PKC+Enz based diet. The PKC contained 15.9% CP, 11.9% EE, 8.3% CF and 50% carbohydrate (by difference). Each treatment was replicated thrice in a completely randomized design, with 3pigs/pen representing a replicate for each of the five treatments. The diets were formulated to contain about 17% crude protein and the pigs were housed in concrete floored pens containing feeding and watering troughs for the 56-day duration of the study. Proximate compositions of test ingredients and feed samples were done according to the methods of A.O.A.C. (1990). Two pigs were randomly selected from each replicate at the end of the feeding trial and sacrificed to evaluate some carcass traits, internal organs and external offals. All the data obtained were subjected to analysis of variance and where statistical significance were observed, the means were compared using the Duncan's Multiple Range (DMR) test. The SAS Computer software package (1991) was used for all statistical analyses.

**Results** The feed intake of the pigs was comparable ( $P>0.05$ ) across the groups but for the 20%Mz + 20% PKC group without FM and enzyme supplementation, which was lower. This resulted in comparable gains across the groups but for the 40% PKC-based diet group with enzyme supplementation (Table 1). Highest net benefit of ₦2,199.70 was recorded for pigs fed with 40% PKC without enzyme, followed by pigs fed 40% PKC with enzyme. The Marginal Rate of Return of 234.44% indicated that farmers stand to gain additional net benefit of ₦234.44 for every additional ₦100 incurred as a result of changing from 40% PKC+enzyme diet for the pigs.

**Table 1** Performance, carcass traits, internal organs and partial budget analysis of growing-finishing pigs fed experimental diets

Parameters	Control	20%PKC	20%PKC+Enz	40%PKC	40%PKC+Enz	SEM
Daily Feed Intake (kg)	2.19 <sup>a</sup>	2.01 <sup>b</sup>	2.15 <sup>a</sup>	2.11 <sup>ab</sup>	2.23 <sup>a</sup>	0.02
Daily weight gain (kg)	0.65 <sup>a</sup>	0.61 <sup>ab</sup>	0.57 <sup>ab</sup>	0.54 <sup>b</sup>	0.56 <sup>ab</sup>	0.02
Feed cost/gain (₦)	289.54 <sup>a</sup>	217.98 <sup>ab</sup>	275.93 <sup>ab</sup>	214.74 <sup>ab</sup>	208.57 <sup>b</sup>	11.50
Dressing (%)	70.40	65.20	65.00	63.40	72.70	1.79
Back-fat thickness (cm)	1.18	1.43	1.31	1.16	1.07	0.07
Liver (%)	2.24 <sup>a</sup>	1.79 <sup>ab</sup>	1.96 <sup>ab</sup>	1.77 <sup>b</sup>	1.81 <sup>ab</sup>	0.07
Value of weight gain @ ₦330/kg	7,140.00	6,090.00	5,610.00	5,790.00	5,460.00	-
Net Benefit (₦)	1,455.64	1,885.88	1,016.74	2,199.70	1,968.37	-

a,b: Means along the same row having different superscript differ significantly ( $P<0.05$ ). \$1= ₦150 (Nigerian Naira)

**Conclusion** It could be concluded that the pigs were able to tolerate up to 20% PKC without enzyme supplementation while the enzyme enhanced the utilization of a higher level of 40% PKC. Feeding of growing-finishing pig with 40% PKC is more cost effective and worthy of adoption by farmers in tropical environments where PKC is found in abundance.

### References

- Acamovic, T. 2001. World's Poultry Science Journal 57, 225-242.  
Alltech. 2008. Allzyme® Vegpro manual. www.alltech.com  
A.O.A.C. 1990. Official methods of analysis (15<sup>th</sup> Ed). Assoc. of Official Analytical Chemists, Arlington, V.A.  
Campbell I.D. and M.R. Bedford. 1992. Enzyme application for monogastric feeds: a review. Canadian Journal of Animal Science. 72, 449-466  
SAS Institute. 1991. SAS® User's Guide: Statistics. Version 6.03 edition. SAS Institute, Inc., Cary., NC.