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CERTAIN OBSERVATIONS ON NUTRITIVE VALUE OF PALM KERNEL MEAL IN COMPARISON TO DEOILED RICE BRAN

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Abstract: Proximate composition, mineral content, metabolizable energy and amino acid contents of palm kernel meal (PKM) were determined and compared with that of de-oiled rice bran (DORB). PKM had numerically higher mean content of protein, crude fibre, nitrogen free extract, calcium, iron, manganese and copper among minerals. Most of the amino acids are numerically higher in PKM than in DORB.
Key words: Amino acid, minerals, palm kernel meal, proximate analysis.

INTRODUCTION

Palm kernel meal (PKM) is an agro-industrial by-product obtained after extraction of oil from palm kernels. It is abundantly available and cheap in the tropical areas of the world. An idea on the nutritive value of PKM would ensure to incorporate in feed as unconventional feed ingredient. Hence this study was undertaken to determine the nutritive value of locally available PKM and compared with that of another agro industrial by-product i.e. Deoiled rice bran (DORB).

MATERIALS AND METHODS

Locally available PKM samples in triplicate were analysed for proximate composition as per AOAC (2000). The metabolizable energy was estimated as per the NRC (1994). The minerals in PKM were estimated by using Perkin Elmer Atomic absorption spectrophotometer (AASAnalyst-300). The table values of proximate principles and energy (Panda *et.al.*, 1997) and minerals (Ramasubha Reddy and Bhosale, 2001) were taken for DORB. Further, the PKM and DORB samples were sent to Degussa India Pvt. Ltd., Mumbai for determination of amino acid composition and reports were obtained.

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RESULTS AND DISCUSSION

The proximate composition, minerals and metabolizable energy values for PKM are shown in Table1. The crude protein value in present study is in close agreement with the value reported by Kim *et al*. (2001). The ether extract content of PKM in present analysis is lower to the value (19.5) reported by Adesehinwa (2007) who used mechanical extracted palm kernel meal. Alimon (2004) was observed the crude fibre value similar to the value found in the present study. On the contrary Lawal *et al*. (2010) reported higher value than the value recorded in this study. The mean value of total ash content in present analysis is in close agreement with the values reported by Onifade and Babatunde (1998). Nitrogen free extract content of PKM in the present study was higher than the value reported by Lawal *et al*. (2010). The estimated metabolizable energy value of PKM is in the range (1480 – 2040 kcal/kg) given by Hutagalung *et al*. (1996). Variation in the proximate and metabolizable energy of PKM given by different scientists might be due to the adoption of different extraction methods and inclusion of various parts of palm kernel fruits. The solvent extraction process causes more concentration of nutrients in the meal than mechanical extraction of oil from palm kernels. However, PKM had numerically higher content of protein, crude fibre and nitrogen free extract and a lower content of total ash when compared to the contents of DORB (14, 13.8, 53.4 and 17.27 % respectively.).

The Calcium content of PKM observed in this study is higher than the value obtained by Hertrampf and Pascual (2003). The phosphorus content of PKM was in the range (0.48-0.71) obtained by Alimon (2004). Further, the lower (0.16-0.33) and higher (0.76-0.93 g/kg)values for the magnesium and potassium respectively were reported by Alimon (2004). Copper, manganese and zinc contents of PKM in the present study are lower than the values reported by Hertrampf and Pascual (2003). However Alimon (2004) reported a higher value for iron content than the present observation. However, the PKM had numerically higher content of calcium and lower content of phosphorus, potassium and magnesium compared to the contents of DORB (0.37, 1.80, 1.36 and 0.76 g/kg respectively). Further the trace minerals like iron and copper were higher and manganese and zinc contents were lower in PKM than in DORB. Variation in mineral composition of PKM among different scientists might be due to type of soil, water, sampling techniques and assay procedures.

Among the different amino acids present in the PKM, glutamic acid content was the highest in the present study (Table 2). Arginine, glycine and lysine content of the PKM are in agreement with the value of Bryden *et al*. (2009). PKM had numerically higher contents of

methionine, arginine, isoleucine, leucine, valine, phenylalanine, glycine, serine, aspartic and glutamic acid when compared to DORB.

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Table1. Chemical composition of PKM

S. No.	Chemical composition	PKM
1	Crude protein	15.32± 0.95
2	Crude fibre	14.39±1.18
3	Ether extract	1.75±0.08
4	Total Ash	4.35±0.50
5	NFE	64.19±2.27
6	M.E (kcal/kg)	1892±10.53
7	Calcium (g/kg)	0.49±0.05
8	Phosphorus (g/kg)	0.68±0.06
9	Magnesium (g/kg)	0.58±0.02
10	Potassium (g/kg)	0.48±0.03
11	Manganese (mg/kg)	63.2±1.81
12	Copper (mg/kg)	15.47±0.86
13	Iron (mg/kg)	469.5±15.06
14	Zinc (mg/kg)	18.45± 0.45

Table 2. Amino acid composition of PKM and DORB

Amino acid	PKM	DORB
Methionine	0.29	0.19
Cystine	0.20	0.21
Methionine + Cystine	0.50	0.40
Lysine	0.44	0.48
Threonine	0.47	0.40
Arginine	1.96	0.79
Isoleucine	0.52	0.36
Leucine	0.99	0.75

Valine	0.77	0.57
Histidine	0.28	0.29
Phenylalanine	0.65	0.49
Glycine	0.72	0.58
Serine	0.67	0.48
Proline	0.54	0.53
Alanine	0.63	0.67
Aspartic acid	1.26	0.95
Glutamic acid	2.86	1.38

DM: Standardized to a dry matter content of 88%.

REFERENCES

[1] Adesehinwa, A.O.K. 2007. Utilization of Palm kernel cake as a replacement for maize in diets of growing pigs: Effects on performance, serum metabolites, nutrient digestibility and cost of feed conversion. *Bulgarian Journal of Agricultural Science*. 13: 593-600.

[2] Alimon, A.R. 2004. The nutritive value of palm kernel cake for animal feed. Palm Oil Development. Malaysian Palm Oil Board, No 4: 12-14.

[3] A.O.A.C. 2000. Official methods of analysis. 18th edition. A.O.A.C., Washington DC.

[4] Bryden, W.L., Li, X., Ravindran, G., Hew, L.I., and Ravindran, V. 2009. Ileal digestible amino acid values in feed stuff for poultry. RIRDC publication No 09/071.

[5] Hertrampf, J.W., and Pascual, F.P. 2003. Hand book on ingredients for aquaculture feeds. Springer publisher, 470 pp.

[6] Hutagalung, R.I., Mohiuddin, M. and Jalaludin, S. 1996. Feeds for farm animals from oil palm. *Indian Oil Palm Journal*. 6: 80-85.

[7] Kim, B.G., Lee, J.H., Jung, H.J., Han, Y.K., Park, K.M. and Han, I.K. 2001. Effect of partial replacement of soybean meal with palm kernel meal and copra meal on growth performance, nutrient digestibility and carcass characteristics of finishing pigs. *Asian-Australasian Jornal of Animal Science*. 14: 821-830.

[8] Lawal, T.E., Iyayi, E.A., Adeniyi, B.A. and Adaramoye, O.A. 2010. Biodegradation of palm kernel cake with multi enzyme complexes from fungi and its feeding value for broilers. *International Journal of Poultry Science*. 9: 695-701.

[9] N.R.C. 1994. Nutrient requirements of Poultry. *National Research Council*, National Academy Press, Washington DC.

[10] Onifade, A.A. and Babatunde, G.M. 1998. Comparison of the utilization of palm kernel meal, brewer's dried grains and maize offal by broiler chicks. *British Poultry Science*. 39: 245-250.

[11] Panda, B., Reddy, V.R., Sadagopalan, V.R. and Shrivastav, A.K. 1997. Feeding of poultry. ICAR, New Delhi. PP:72-73

[12] Ramasubba Reddy, V. and Bhosale, D.T. 2001. Hand book of poultry nutrition. American Soybean Association 168, Jor bagh, New Delhi, India. PP:110.