

# CHEMICAL COMPOSITION AND NUTRITIVE VALUE OF PALM KERNEL CAKE AND PALM PRESS FIBRE IN RUMINANTS

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Palm kernel cake (PKC) and palm press fibre (PPF) from the oil palm milling industry have been subjected to intensive studies in the ruminants in Malaysia. PKC and PPF represent 12 and 5% of the fresh fruit bunch. The PKC is obtained by solvent or expeller processes. Expeller PKC contained: 90% DM, 4.1% ash, 15.6% fibre, 8% fat, 12.9% protein and 15.82 MJ GE/kg. Pelletting or supplementation by molasses or carbohydrate rich sources improved the PKC intake by buffaloes and cattle. Higher oil and shell constituents of expeller PKC have been the contributing factors in intake reduction. Increased intake from feeding deshelled PKC was observed in beef animals.

PPF contained (90% dry matter basis): 5.8% ash, 75.4% NDF, 52.8% ADF, 13.5% fat, 6.7% protein, 21 to 25% Lignin and 17.13 MJ GE/kg. High moisture content facilitates rancidity and mould growth, low palatability resulting in poor intake and consequently low digestibility. Molasses and urea supplementation to beef cattle and buffaloes improved the palatability and digestibility of PPF. Impaction was observed occasionally in beef animals consuming large amounts of PPF. This was prevented by balancing the nutrients and feed additive supplementation. Using nylon bag technique showed slow dry matter disappearance (DMD) of 18, 26 and 42% at 8, 24 and 48 hr, respectively, and in steers 10, 20 and 25% at 8, 24 and 48 hr, respectively. About 42-47% of PPF dry matter was digested in the rumen of buffaloes. The soluble components and rumen degradation compared favourably to grasses. Improper separation of fibrous and shell fractions during the extraction process results in PPF containing a high proportion of broken shells and kernels making the PPF less available.

Chemical treatments of PPF with NaOH, urea or  $\text{NH}_4\text{OH}$  significantly increased DMD in the rumen of buffaloes and steers. As the feeding value of PPF is low, its supplementation with other nutrients (soluble carbohydrates, nitrogen, minerals, vitamins) is necessary for growth above the maintenance requirements of the ruminants. Supplementary effects of urea, fishmeal, soybean meal, maize and cassava root meal in the PKC-based concentrate were also studied. Minerals, vitamins, buffer agents and sulphur were added to the diets.

Ammonia-treated PPF (5% aqueous  $\text{NH}_4\text{OH}$ ) at 10-14 days storage contained 16.7-18% protein, had lower NDF and ADF contents than untreated PPF. Increased IVDMD from 42-49 to 51.8-57.6% at day 1 and 10, respectively was observed. Preliminary results of feeding ammonia-treated PPF to beef animals showed significant improvement in daily gains and total DM intake compared with untreated PPF.

These results suggest the possibility of using chemically treated PPF in combination with palm kernel cake in feeding the large ruminants under an intensive system.

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