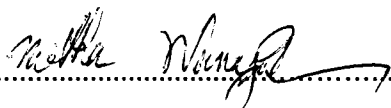
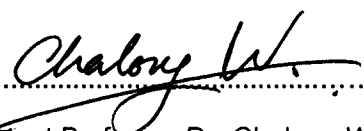


THESIS TITLE : EFFECTS OF DIETARY CARBOHYDRATE AND/OR BY-PASS PROTEIN  
ON VOLUNTARY FEED INTAKE, DIGESTIBILITY AND RUMINAL  
FERMENTATION IN DAIRY CATTLE FED RICE STRAW AND UREA-  
TREATED RICE STRAW AS ROUGHAGES.

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#### ABSTRACT

This experiment was to study the effects of supplementation of either dietary carbohydrate or by-pass protein on voluntary feed intake, digestibility, ruminal fermentation and microbial protein synthesis in dairy cattle. Four ruminal fistulated steers, about 3 years of age, with average liveweight of  $350 \pm 10.5$  kg were randomly allotted into a 4x4 Latin square design. Cassava chip (CC) was used as a carbohydrate source while cottonseed meal (CS) was used as a by-pass protein source. The dietary treatments were as followed: treatment A rice straw (RS) and supplemented with cassava chip mixed with urea (urea, U) (2 kg/d) (RS+CC+U), treatment B urea-treated rice straw (URS) and supplemented with cassava chip (2 kg/d) (URS+CC), treatment C URS supplemented with CS (0.5 kg/d) (URS+CS) and treatment D URS and supplemented with both cassava chip (2 kg/d) and cottonseed meal (0.5 kg/d) (URS+CC+CS). Four experimental periods were employed and each period lasted for 27 days. In each period, the animals were adjusted for 17 days before total collection

was made during the last 10 days. During the experiment, the animals were housed in metabolism crates and fed the diets twice daily at 7.30 am. and 15.30 pm. as two equal meals and fresh water was freely available at all times. Rumen fluid and jugular blood were collected on the last day of each period. Ruminal pH was measured immediately after ruminal fluid was sampled. Voluntary roughage intakes of URS+CS (8.8 kgDM/d) and URS+CC+CS (7.8 kgDM/d) treatments were higher ( $p<0.05$ ) than those of RS+CC+U (5.7 kgDM/d) and URS+CC (6.3 kgDM/d) treatments. Dry matter, organic matter, NDF and ADF digestibilities were not significantly different among dietary treatments. Digestion coefficient of crude protein of URS+CC+CS (61.5 %) was higher than other diets. The nitrogen balance in URS+CC+CS (69.9 g/d) and URS+CS (71.0 g/d) were higher ( $p<0.01$ ) than those of RS+CC+U (35.0 g/d) and URS+CC (34.1 g/d). Ruminal pH value and blood urea-nitrogen concentration were not different among dietary treatments. The ruminal ammonia-nitrogen concentration in URS+CC+CS (11.6 mg%) and URS+CS (11.2 mg%) treatments were higher ( $p<0.05$ ) than those of RS+CC+U (9.0 mg%) and URS+CS (9.4 mg%) treatments. Total volatile fatty acid (TVFA) in URS+CC+CS (82.9 m mol/l) treatments was higher ( $p<0.05$ ) than that of URS+CS (65.5 m mol/l), RS+CC+U (59.6 m mol/l) and URS+CS (65.2 m mol/l) treatments. The estimation of microbial nitrogen from purine derivatives excretion in urine of URS+CC+CS (136.7 gN/d) treatment was higher ( $p<0.05$ ) than that of RS + CC + U ( 67.5 gN/d) treatment, but were not significantly different as compared with those of URS + CS (104.4 gN/d) and URS + CC (89.5 gN/d) treatments. Microbial protein to energy ratio (P/E ratio) of URS+CC+CS (14.8 g microbial protein/ MJ of VFA) treatment was higher ( $p<0.05$ ) than that of RS+CC+U (10.3 g microbial protein/ MJ of VFA) treatment, but were not different as compared with URS+CS (14.8 g microbial protein/ MJ of VFA ) and URS + CC (12.9 g microbial protein/ MJ of VFA) treatments.