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## Site and Extent of Cottonseed Meal Protein Digestion Substituted for Soybean Meal in Concentrate Diets of Steers

A. WARITTHITHAM<sup>1</sup>, THERDCHAI VEARASILP<sup>2</sup>, CHOKE MIKLED<sup>2</sup>, A. SIMASATITKUL<sup>2</sup>, T.  
APICHARTSRUNGKON<sup>2</sup>, SOMPONG SRUAMSIRI<sup>3</sup>, UDO TER MEULEN<sup>4</sup>

<sup>1</sup>*Maejo University, Thailand*

<sup>2</sup>*Chiang Mai University, Department of Animal Science, Thailand*

<sup>3</sup>*Maejo University, Department of Animal Technology, Thailand*

<sup>4</sup>*Georg-August-Universität Göttingen, Institute of Animal Physiology and Nutrition, Germany*

### Abstract

Cottonseed meal (CSM) is by product and can be obtained from cotton fiber and cottonseed oil industry. Compared to Soybean meal (SBM), CSM contains slightly lower amounts of crude protein (CP) and energy, but is higher in fiber and rumen undegradable protein (RUP).

The experiment was conducted at Chiang Mai University, Thailand, to determine the nutrient quality of CSM substituted for SBM in steer diets in a 4 × 4 Latin Square Design. Each steer was fitted with rumen fistula, and cannulae at duodenum and ileum. The steers were fed concentrate diets containing CSM substituted for SBM as protein source at levels 0, 50, 75 and 100%. Diets were fed at 3 %BW and contained 50% rice straw and 50% concentrate diet. TiO<sub>2</sub> was used as indicator for this experiment. Digestibility of dry matter (DM), organic matter (OM) crude protein (CP) and true protein (TP) at rumen, small intestine, large intestine and total tract were determined.

The amount of free gossypol in concentrate diets were 0.01, 0.07, 0.12 and 0.14% of DM respectively. There was no apparent health disorder during the experimental period. DM and OM digestibility based on the amount of intake at rumen, small intestine, large intestine and total tract were not significantly different among treatment groups. There were no significant differences in the amount CP increased in rumen. The amount of digestible CP and TP in small intestine and its digestibility based on the amount entering small intestine were not significantly different. There were no effects in ruminal pH and NH<sub>3</sub>-N (11.32, 12.93, 10.29 and 10.46 mg/100ml).

It was concluded that CSM could substitute SBM as protein source in concentrate diets up to 100% without any symptoms of gossypol toxicity and had similar values of DM, OM, CP and TP digestibility, ruminal pH and ruminal NH<sub>3</sub>-N to SBM.

**Keywords:** Cottonseed meal, gossypol, large intestine, nutrient digestibility, rumen, small intestine, soybean meal, TiO<sub>2</sub>, total tract