



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Efficiency of Microbial Protein Synthesis in Steers Fed Freshly Harvested Tropical Grass

MARTHEN LUTHER MULLIK

University of Nusa Cendana, Faculty of Animal Science, Department of Animal Nutrition, Indonesia

Abstract

Rumen microbial crude protein (MCP) supply is a vital element in the rumen models to predict respond of ruminants to a certain feeding regime. Data from tropical pastures always below predicted results from the existing rumen models due to the fact that database used in the models are derived mainly from temperate pastures. Thus, quantification of the rumen MCP supply from tropical pastures is expected to improve predictive rate of the models under tropical feeding condition. Four Brahman crossbred steers (457 ± 20.1 kg) were used in a metabolism study to quantify efficiency of microbial protein synthesis (EMPS) in cattle consuming a freshly harvested tropical grass. Pangola grass (*Digitaria erianthe* cv. Steudal) was harvested every morning and fed to the animals soon after. Data were collected over 1 week after the steers were previously adapted to this diet for 2 weeks. Parameters regarded were EMPS, intake, fractional passage rates, and rumen ammonia concentration. Passage rates were estimated using dual marker (chromium-EDTA and ytterbium) technique. The EMPS was estimated using purine derivative excretion in urine (total urine collection method). The EMPS value obtained was compared to the values in the feeding standards. Mean crude protein (CP) and water soluble carbohydrates (WSC) were 6.3 and 7.4 of dry matter (DM) respectively. Mean DM intake was 1.6 % W. Average rumen ammonia ($\text{NH}_3\text{-N}$) concentration was $69 \text{ mg NH}_3\text{-N l}^{-1}$ whilst rumen passage rates were 7.48 and 6.92% h^{-1} for fluid and solids respectively. Mean EMPS in the steers was only 72 g microbial crude protein (mcp) kg^{-1} digestible organic matter (DOM). It might be concluded that EMPS in steers consuming freshly harvested pangola grass, with the above nutritional characteristics, was below the minimum level for forage diets adopted in the current feeding standards.

Keywords: Efficiency, Rumen microbes protein, steers, tropical grass