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Utilisation of Dried Malt Residue as Dairy Cattle Feed

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Abstract

The study was conducted to determine the chemical composition of dried malt residue and its effects when supplemented at 0, 20, 30 and 40 % in diets for dairy cattle. Apparent digestibility of experimental diets was studied both conventionally and by the indicator method. Titanium oxide was used as the marker. Four Thai crossbred native × Holstein Friesian cows, fitted with rumen, duodenal and terminal ileum cannulae were used. Rumen pH, ammonia nitrogen and volatile fatty acid concentration were measured. The dried malt residue had 85.95 % DM and the nutrient profile in percentage of DM was: 80.19 % organic matter, 18.55 % crude protein, 2.32 % ether extract, 13.13 % crude fibre, 51.85 % neutral detergent fibre and 22.69 % acid detergent fibre. Dry matter digestibility on 0, 20 and 30 % dried malt residue diets were not significantly ($p > 0.05$) different. Total digestible nutrients, gross energy, metabolisable energy and net energy for lactation on 0, 20, 30 and 40 % dried malt residue diets were not significantly ($p > 0.05$) different but tended to decrease at higher levels of dried malt residue. Dry matter, organic matter and crude protein digestibility in the small intestine on the control diet were significantly ($p < 0.05$) higher than on the 30 and 40 % dried malt residue diets. Crude protein flow to duodenum was not significantly ($p > 0.05$) different across diets. Rumen pH was not different across diets. However, ammonia nitrogen levels in the rumen, 1 hour after feeding in 0, 20 and 30 % dried malt residue diets were significantly ($p < 0.05$) higher than on the 40 % inclusion diet. At 3 hours post-feeding ammonia nitrogen level in the diet with 30 % dried malt residue inclusion was significantly ($p < 0.05$) higher than on 0, 20 and 40 % dried malt residue inclusion diets. Total volatile fatty acid concentrations in 0, 20, 30 and 40 % dried malt residue diets tended to decrease at higher levels of dried malt residue although this did not reach significance ($p > 0.05$). However, acetic to propionic acid ratio in 30 % dried malt residue diet was significantly higher than at 40 %. It could be economical to incorporate dried malt residue in certain circumstances of dairy feeding.

Keywords: Dairy cattle, dried malt residue