

A study of fuel price increase and its influence on selection of mode of transports

Abstract

BACKGROUND: Molecular weights (MWs) and their chemical structures are the primary factors determining the influence of condensed tannins (CTs) on animal nutrition and methane (CH₄) production in ruminants. In this study the MWs of five CT fractions from *Leucaena leucocephala* hybrid-Rendang (LLR) were determined and the CT fractions were investigated for their effects on CH₄ production and rumen fermentation.

RESULTS: The number-average molecular weight (M_n) of fraction F1 (1265.8Da), which was eluted first, was the highest, followed by those of fractions F2 (1028.6Da), F3 (652.2Da), F4 (562.2Da) and F5 (469.6Da). The total gas (mL g⁻¹ dry matter (DM)) and CH₄ production decreased significantly ($P \leq 0.05$) with increasing MWs of the CT fractions, but there were no significant ($P > 0.05$) differences between the CT fractions and control on DM degradation. However, the in vitro N disappearance decreased significantly ($P \leq 0.05$) with the inclusion of CT fraction F1 (highest MW) compared with the control and other fractions (F2-F5). The inclusion of CT fraction F1 also significantly decreased ($P \leq 0.05$) total volatile fatty acid and acetic acid concentrations compared with the control. The acetic/propionic acid ratio was significantly decreased ($P \leq 0.05$) by fraction F1 but not by the control and other fractions (F2-F5).

CONCLUSION: The CT fractions of different MWs from LLR could affect rumen fermentation and CH₄ production, and the impact was more pronounced for the CT fraction with a higher MW. © 2014 Society of Chemical Industry.