

In vitro digestibility and gas production characteristics of four Napier (*Pennisetum purpureum*) cultivars as fresh fodder

ABSTRACT

Napier grass was first introduced to Malaysia in the 1920's and there were many cultivars introduced in Malaysia since 1950's. However, there is a need to have comparative evaluation of these Napier cultivars so that definite recommendations can be made in the choice and management of the respective cultivars. The experiment was conducted to evaluate the in vitro digestibility and gas production characteristic of four Napier (*Pennisetum purpureum*) cultivars, namely Common, Silver, Red and Dwarf Napier. Common, Silver and Red Napier are classified as tall cultivars while Dwarf Napier is a short cultivar. Gas production was determined at 2, 4, 6, 8, 12, 24, 32, 36, 48, 72 and 96 h of incubation period and its kinetics was described using the equation $p = a + b(1 - e^{-ct})$. Dwarf Napier had the highest ($P < 0.05$) nutritive quality (16% CP; 75% IVDMD and 73% IVOMD) among the cultivars. Overall, tall cultivars were higher ($P < 0.05$) in NDF, ADF, and ADL content than Dwarf Napier cultivar. The potential gas production (A+B) at 96 h incubation period was higher ($P < 0.05$) in Dwarf Napier cultivar (65 mL/200 mg DM) compared to other tall cultivars (< 57 mL/200 mg DM). There were no significance differences ($P > 0.05$) in the rate of gas production (C) of Napier cultivars which ranged from 0.024 to 0.035 h⁻¹. The metabolisable energy (ME) was significantly higher in Dwarf and Red Napier cultivars (8.7 MJ/kg DM) compared to Silver and Common Napier cultivars. The cumulative gas production within 32 h was highest ($P < 0.05$) in Red and Dwarf Napier cultivars. The total VFA concentration, acetic and butyric acid content of Napier cultivars ($P > 0.05$) ranged from 52 to 73 mM, 88 to 70%, 6.2 to 6.8%, respectively.. Dwarf Napier cultivar had superior nutritional quality. Dwarf and Red Napier cultivars could be classified as high quality grasses due to their high digestibility, gas production and degradation rates compared to the other cultivars. The low quality of Common and Silver Napier cultivars is mainly reflected by the extensive lignification of their cell wall structure.

Keyword: Napier cultivars; Nutritive quality