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Assessment of oxalate content and their nutritive values of different Napier cultivars in Bangladesh

MUHAMMAD KHAIRUL BASHAR^{1,2}, SM JAHANGIR HOSSAIN², PANIR CHOUDHURY², MD. TASMIRUL ISLAM², MD. NAZMUL HUDA², SHAHRINA AKTER²

¹*University of Hohenheim, Dept. of Animal Nutrition, Germany*

²*Bangladesh Livestock Research Institute (BLRI), Biotechnology, Bangladesh*

Abstract

Many farmers prefer Napier grass because of its excellent biomass yield, elevated crude protein concentration, and easy propagation. However, Napier grass contains oxalate, which is an anti-nutritional compound. The ongoing research work has identified the cutting-edge Napier cvs. that consistently preserve the standard oxalate content while achieving high biomass production and nutrient composition. The five Napier cultivars (Napier-3 (hybrid), Napier-4 (Vietnam), Napier-5 (salt-tolerant), Puckchong, and Napier colour) have been chosen for the purpose of quantifying the oxalate content at intervals of 10, 20, 30, 40, and 50 days with two replications. The land was then divided into 10 equal plots of $4 \times 4 \text{ m}^2$, separated by an alley of about 1.5 m. All agronomical practices, such as fertiliser doses (2:1:1; N: P: K), irrigation, and weeding, were the same. To follow the cutting intervals, the sample was collected for chemical analysis (DM, CP, ADF, and NDF) at the animal nutrition laboratory of Bangladesh Livestock Research Institute (BLRI) and also determined the oxalate content to follow Martz FA et al., 1990 protocol at the BCSIR lab. After a 30-day period, Napier-3 exhibited a 1.55% oxalate production rate, with CP and ADF levels of 18.5% and 32.0%, respectively. This stage proved to be the most effective in reducing oxalate content (below 2% for ruminant animals) while maximising nutritional levels. Regarding Napier-5 and Pakchon grass, when 20 days old, they showed encouraging outcomes in terms of elevating CP levels (19.5% and 20.5%, respectively) and reducing ADF (30.5% and 31.0%, respectively) and oxalate content (1.27% and 1.14%, respectively). There was no notable interaction between Napier-4 and Napier colour. In conclusion, the Napier cultivars were graded according to their high nutrient and low oxalate levels: Pakchon > Napier-5 > Napier-3 > Napier colour > Napier-4.

Keywords: Napier cultivars, nutritive value, oxalate