

A Narrative Review on Effects of Napier Grass Oxalate Accumulation on Ruminant Animals

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ABSTRACT

Napier grass is a popular ruminant feed due to its nutritional value and ease of propagation. Besides these promising characteristics, Napier grass poisoning has been reported in livestock, and oxalate has been identified as a primary toxin. Oxalate is an antinutrient content that prevents absorption of minerals from plants while grazing by animals. Less than 2.0% of ruminants' soluble oxalate of dry matter (DM) consumption is safe, while 0.5% is safe for non-ruminants. Oxalate buildup varies with nitrogen sources and dosages. This review discusses the impacts of external and internal elements, including fodder species/variety, fodder portions, seasonal change, nitrogen fertilization, clipping interval, and oxalate concentration on grazing animals and management measures to reduce fodder oxalate. However, further research is needed to understand how oxalate in different species interacts with grazing animals. For developing oxalate-free fodder genotypes, molecular techniques, including identification of CRISPR/Cas9, QTLs, and functional genomics, may be helpful. Genomic methods to improve Napier grass employing precision phenotyping, genotyping, and molecular technology have also been discussed in this article. We have discussed the metabolic pathway, digestion in ruminant animals, factors affecting oxalate

content, genetic and molecular diversity, oxalate impact and poisoning, disease to Napier grass and future prospects. This may be helpful for the researchers working on ruminant animals for their feeds and fodder.

Keywords: Napier grass, oxalate, genotype, mineral, ruminants, oxalate-free fodder genotypes.