Oxidative stress parameters in water buffaloes supplemented stevia

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Abstract

Objectives: Stevia (Stevia rebaudiana Bertoni) is a perennial green plant widely recognized for its intense natural sweetness, primarily derived from the diterpene glycoside stevioside found in its leaves. The extract of Stevia is rich in flavonoids and polyphenolic compounds, including substantial concentrations of chlorogenic acid. This study aimed to evaluate the effects of dietary supplementation with Stevia on the antioxidant status of buffaloes and the principal nutritional composition of their milk. Methods: To achieve this objective, a comprehensive assessment and comparative analysis were conducted, encompassing key biochemical parameters, oxidative stress biomarkers, and the concentrations of selected interleukins and cytokines. These measurements were used to determine the systemic impact of Stevia rebaudiana supplementation on oxidative balance and immune modulation in buffaloes. Results: The inclusion of Stevia in the buffalo diet did not induce significant changes in the lipid composition of the milk. However, it exerted a pronounced beneficial effect on the animals' oxidative status. Reductions in oxidative damage and pro-inflammatory cytokines, along with a balanced modulation of endothelial (eNOS) and inducible nitric oxide synthase (iNOS) activity, indicated that Stevia rebaudiana supplementation fosters a more favorable redox and inflammatory profile. This integrated physiological response suggests improved endothelial function and enhanced systemic resilience in the supplemented buffaloes.

Keywords: buffaloes; stevia; oxidative stress; ROS; SOD