



Anthocyanins as a Natural Feed Additive for Methane Mitigation in Ruminant Nutrition

Abdulhamid Muhammad Garba^{1*}, Sema Yaman Fıncıoğlu²

¹Graduate School of Natural and Applied Sciences, Niğde Ömer Halisdemir University, Niğde, Türkiye.

²Department of Animal Production and Technologies, Faculty of Agricultural Sciences and Technologies, Niğde Ömer Halisdemir University, Niğde, Türkiye.

Abstract

Ruminant animal enteric methane emissions contribute significantly to the accumulation of greenhouse gas and also represent a great loss of dietary energy. Natural feed additives that can reduce methane emissions without any negative effect on animal performance have been the focus of recent researches to enhance the sustainability of livestock production. Anthocyanins are naturally occurring flavonoid pigments richly available in purple corn, grape pomace, purple rice, black cane and other plants. They have antioxidant, antimicrobial, and rumen-modulating characteristics making them a potential option for enteric methane emissions mitigation. Anthocyanins have been shown to boost fermentation efficiency, decrease methanogenic archaea, interfere with microbial ecology of the rumen, and reroute hydrogen use toward propionate synthesis. This review examine the function of anthocyanins as a natural methane mitigation agents in ruminant nutrition. Their mode of action, effects on rumen microbiota and fermentation characteristics, effects on animal performance, and potential contributions to sustainable ruminant animal production are all given a careful emphasis. Limitations and future research directions are also addressed.

Keywords: Methane mitigation, anthocyanins, rumen fermentation, ruminants, methane emissions

