

Effects of *in vitro* supplementation of mulberry leaf flavonoids on microbial flora, methanogenesis and fermentative products in rumen fluid of sheep

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ABSTRACT:

Little information is available on the nutritive value of mulberry leaves as efficient use of feed in livestock production particularly in the temperate regions of hot countries, reduction of methane emissions by ruminants as well as great significance in mitigating climate warming, this study was undertaken to fulfill these objects. Four experiments were conducted to investigate the effects of *in vitro* supplementation of Mulberry Leaf Flavonoids (MLF) on fermentative products including total gas volume, accumulated methane, total Volatile Fatty Acids (VFA), hydrogen index (pH) and ammonia concentration (NH₃) in the rumen liquid of sheep.

Four concentrations of mulberry leaf flavonoids (0, 10, 15, 20 mg/100 g) Dry Matter (DM) concentrated diet and alfalfa hay were applied. The treatments and the fermentation hours were the factors and four repetitions for each treatment were made in time. The treatments and chemical composition, were determined at 24, 48, 72 and 96 h of fermentation. There were significant differences (P<0.01), in fermentative products of the compositions of rumen fluid for the four treatment according to four executive intervals in comparison with the control treatment. The obtained results allowed to conclude that the concentration of mulberry leaf flavonoids (15 mg/100 g) was the best *in vitro* supplementation for the digestibility of dry matter which revealed improving the digestibility, as well as relatively elevation in the total gas production and significant decrease in methane emission and relative elevation of the Total Volatile Fatty Acids (TVFA), normal pH, and balanced ammonia concentration (NH₃) in rumen fluid of the sheep and mulberry leaves can be used as an alternative source of feed for the maintenance of sheep.

Keywords:

Mulberry leaf flavonoids, Rumen microbial flora, Methanogenesis, Rumen fluid, Sheep.