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Editors
Sania Subhan Qureshi
Rifat Ullah Khan
M Subhan Qureshi
Sher Bahadar Khan
Shakoor Ahmad Qureshi
Mithat Direk

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Mobile/WhatsApp: +92 301 894 5994; Email: i.quraysh@gmail.com
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EFFECTS OF SOME FEED ADDITIVES ON IN VITRO DIGESTION, RUMEN FERMENTATION AND METHANE PRODUCTION IN DIFFERENT FORAGE AND CONCENTRATED FEEDS

Necip Gürhan Şekerci¹, Birol Dağ¹, Yusuf Konca², Selma Büyükkılıç Beyzi², Mahmut Kaliber²
¹Selçuk University, Faculty of Agriculture, Department of Animal Science, Konya/Turkey
²Erciyes University, Faculty of Agriculture, Department of Animal Science, Kayseri/Turkey
akidal_@hotmail.com

ABSTRACT:

Essential oils as natural products (EO) sometimes modifying rumen fermentation parameters. A number of studies have recently evaluated the ability of essential oils to reduce enteric CH₄ production due to high doses (i.e., >300 mg/L of culture fluid). In this study, effects of oregano, sage and mint EO (essential oil) were evaluated in in vitro 24 h batch culture of diluted rumen fluid at 10:90 and 90:10 forage: concentrate included diet. Treatments were: control (C), oregano (O, 300mg/L), sage (S, 300mg/L) and mint (M, 300mg/L) essential oils. After 24 h, pH was determined in the culture fluid and samples were analyzed for volatile fatty acid (VFA) concentrations, organic matter digestibility (OMD), total gas and methane productions. Rumen acetate, propionate and butyrate proportions were not affected by EO supplementation (P>0.05). Similarly, rumen total gas production and OMD were not affected by EO supplementation (P>0.05). However oregano, sage and mint oils increased rumen methane production and decreased rumen pH (P<0.05). While increasing concentrate feed ratios increased total gas production and OMD; decreased methane production and pH in the rumen (P<0.05). Contrary to expectations, these EOs increased production of methane in the rumen. In this case, the performance of the animals may be adversely affected.

Keywords: rumen fermentation. Methane production, feed additives, essential oils