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Effects of supplementing vitamin E on in vitro rumen gas production, volatile fatty acid production, dry matter disappearance rate, and utilizable crude protein

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Two in vitro trials were carried out to study the effects of supplementing vitamin E (V_E) on rumen fermentation. In Trial I, four levels of V_E product (purity 50%), i.e. 0, 15, 30, and 60 mg/kg dry matter (DM) of feed (equivalent to 0, 7.5, 15, 30 IU V_E /kg DM) were supplemented to a typical feed mixture, respectively, as experimental treatments. The gas test technique of Menke et al. (1979) was used to measure gas and volatile fatty acid (VFA) production. In Trial II, the in vitro incubation technique of Zhao and Lebzién (2000) was used to determine DM disappearance rate and utilizable crude protein (uCP). Four levels of V_E , i.e. 0, 7.5, 15, 30 IU/kg DM were supplemented to the same feed mixture as in Trial I, respectively, as experimental treatments. The results showed that supplementing V_E increased total gas production ($P < 0.01$) and tended to increase methane (CH_4) production ($P = 0.087$). Supplementing V_E also increased total VFA ($P < 0.05$) and propionate ($P < 0.05$), tended to increase acetate production ($P = 0.084$), and significantly increased DM disappearance rate ($P < 0.05$) and uCP ($P < 0.01$). It was concluded that supplementing V_E at 30 IU/kg DM under the conditions of present trials with 11.1 IU/kg DM in the feed mixture improved in vitro rumen fermentation of feed mixture. Further research is necessary to confirm the effects of supplementing V_E using in vivo trials.

Keywords:

vitamin E; rumen fermentation; in vitro

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