

In vitro effects of corn silage supplemented with sunflower oil and bacterial inoculants on sheep lipid metabolism, rumen fermentation and ciliate population

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Influence of corn silage (CS) supplemented with sunflower oil (SO) on the rumen fermentation parameters, growth of ciliate population and fatty acid outputs has been investigated for 72 h using *in vitro* fermentation technique. The rumen fluid (RF) from ruminally fistulated sheep were mixed with McDougall's buffer (1:1) and added (35 ml) to the fermentation bottles containing 1.5 g (0.38 g/kg of DM) of CS with or without SO (30 g/kg of DM). The four types of CS were used: un-inoculated (CS) or inoculated with *Lactobacillus plantarum* CCM 4000 (CS+LP), *Lactobacillus fermentum* LF2 (CS+LF) or *Enterococcus faecium* CCM 4231 (CS+EF) in simultaneous incubations at $39 \pm 0.5^\circ\text{C}$ for 72 h *in vitro*. Sunflower oil decreased total gas production (by 16–17%) in CS and all inoculated CS. SO did not significantly influence methane production of un-inoculated and inoculated CS. Concentration of total VFA ($P < 0.001$), and molar proportions of acetate ($P < 0.001$), propionate ($P < 0.05$) and *n*-butyrate ($P < 0.001$) were influenced by SO. Sunflower oil had no significant effect on the total ciliate number and growth of examined ciliate species *Entodinium* spp., *Polyplastron multivesiculatum*, *Enoploplastron triloricatum*, *Diplodinium denticulatum*. The number of *Dasytricha ruminantium* with the CS+LP was higher ($P < 0.01$) as compared to CS. Outputs of *trans* vaccenic acid (TVA), linoleic acid (LA), conjugated linoleic acid (CLA) and α -linolenic acid were influenced by SO ($P < 0.05$; $P < 0.01$; $P < 0.001$). However, the output of CLA only in CS+LF was increased ($P < 0.001$). It can be concluded that, sunflower oil with inoculated and un-inoculated corn silage could be effective for increase of TVA in rumen fluid of sheep.

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