



Effect of phytosterols on rumen fermentation *in vitro*

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ABSTRACT. We investigated the effect of phytosterols on rumen fermentation *in vitro* using gas syringes as incubators. Phytosterols were dissolved in ethyl acetate (8.3%) and added at various concentrations to the common diet in rumen fluid. *In vitro* gas production (GP) was recorded after 3, 6, 12, 18, and 24 h incubation. Incubation was stopped at 6, 12, and 24 h and the inoculants were then tested for pH, dry matter digestibility (DMD), microbial protein yield (MCP), lactic acid, NH₃-N, and volatile fatty acids (VFAs). GP was consistently higher than the control; particularly, treatments at 12, 18, and 24 h reached extremely significant levels ($P < 0.01$). Compared to the control group, the pH of ruminal fluid was slightly lower after incubation, and DMD and MCP increased with increasing phytosterol level except for the content of MCP at 6 h, which changed only minimally. Lactate was significantly lower after treatment compared to the control at 12 h ($P < 0.01$) and 24 h ($P < 0.05$), while NH₃-N at 12 h ($P < 0.05$) and 24 h ($P < 0.01$) after treatment decreased significantly. Acetate, propionate, butyrate, and total VFA for all treatments were higher than those of the control, particularly for butyrate at 6 h ($P < 0.01$). These results suggest that phytosterols modify rumen fermentation by inhibiting released harmful products and promoting the release of beneficial product, which may be

useful for improving nutrient utilization and animal health.

Key words: Phytosterols; Rumen fermentation; Cow