动物营养学报
CHINESE JOURNAL OF ANIMAL NUTRITION

动物营养学报 » 2014, Vol. 26 » Issue (2) :489-495 DOI: 10.3969/j.issn.1006-267x.2014.02.026

硫胺素对高精料底物瘤胃体外发酵培养液挥发性脂肪酸和乳酸浓度的影响

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Effects of Thiamine on Concentrations of Volatile Fatty Acids and Lactate in Culture Medium of High Concentrate Substrate after *in Vitro* Rumen Fermentation

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- 摘要
- 参考文献
- 相关文章

摘要 本试验旨在研究高精料底物条件下添加硫胺素对瘤胃体外发酵培养液挥发性脂肪酸和乳酸浓度的影响。选择4头身体健康状况良好、安装永久性瘤胃瘘管的荷斯坦奶牛，用于瘤胃液的采集。以酪蛋白、小麦淀粉、可溶性淀粉、果胶、木聚糖、滤纸纤维素、羧甲基纤维素为原料，设计精粗比为6：4的发酵底物，硫胺素的添加量分别为0、60、120、180和240 mg/kg。结果表明，高精料底物条件下，添加硫胺素整体上降低了培养液乳酸的浓度，并以添加180 mg/kg硫胺素组效果较好，同时该组还提高了总挥发性脂肪酸的浓度，降低了乙酸与丙酸比例。综上所述，添加180 mg/kg的硫胺素能够较好地稳定高精料（6：4）底物的瘤胃发酵。

关键词： 硫胺素 瘤胃发酵 乳酸 挥发性脂肪酸

Abstract： This experiment was conducted to study the effects of thiamine on concentrations of volatile fatty acids and lactate in culture medium of high concentrate substrate after *in vitro* rumen fermentation. Four healthy Holstein dairy cows equipped with permanent ruminal cannulas were used to provide rumen fluid. The fermentation substrate was consist of casein, wheat starches, soluble starches, pectins, xylan, milled filter paper and carboxymethyl cellulose, and the concentrate to forage ratio was 6：4. The supplemental levels of thiamine were 0, 60, 120, 180 and 240 mg/kg, respectively. The results showed as follows: generally, the lactate concentration in culture medium was decreased by thiamine under the condition of high concentrate substrate, and 180 mg/kg group showed the best effect. It was also observed that 180 mg/kg group increased total volatile fatty acid concentration but decreased the ratio of acetate to propionate. It is concluded that the supplemental level of 180 mg/kg thiamine can stabilize rumen microbial fermentation of high concentrate substrate with 6：4 of the concentrate to forage ratio.

Keywords： thiamine, rumen fermentation, lactate, volatile fatty acid

收稿日期: 2013-08-19;

基金资助:

国家自然科学基金项目（31072051）；江苏省自然科学基金项目（BK2011447）；江苏省优势学科

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