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Agricultural Research, Education and Extension Organization

Agriculture and Natural Resources Research

Animal Science Research Institute

Studying the rumen metabolites changes in sheep exposed to ruminal acidosis

Research worker: Mojtaba zahedifar

Abstract

The aim of this research was to study the effect of different levels of concentrate in the diet on ruminal pH, concentration of volatile fatty acids in the rumen and voluntary feed intake. For this purpose, a number of eight rumen fistulated Chall lambs were used. This experiment was conducted in the four periods and in each period eight sheep were used (2 sheep for each treatment). Four diets were tested in this experiment. Alfalfa was used as control and alfalfa plus four levels of ground barley grain including: 60%, 70% and 80%. Each period lasted for 15 days including 14 days for adaptation and 1 day for sampling. Samples of rumen liquor (every 2 hours) were collected through rumen fistula. Animals were fed twice daily (8:00 and 16:00) and food consumption was measured. (total of 12 samples of rumen fluid from each lamb) and rumen pH was measured. The rumen liquor samples were analyzed for volatile fatty acids. Results showed that rumen pH decreased by increasing the levels of concentrate in the diet (average rumen pH during the 24-hour sampling at the end of the each experimental period: 6.65, 5.99, 5.86 and 5.56 respectively for control, 60, 70 and 80% diets). Increasing the amount of concentrate in the diet affected levels of total volatile fatty acids (total VFA after 8 hours of morning feeding were: 11.8, 108.9, 114.6 and 93.2 mmol per liter for control, 60, 70 and 80 % concentrate respectively). Increasing the level of concentrate in the diet increased the percentage of propionate and consequently decreased the percentage of acetate and acetate to propionate ratio. The results of this trial showed that the diet containing 80% concentrate can cause rumen acidosis and provide the conditions needed for testing the effect of slow released buffers.

Keywords: levels of concentrate, Volatile fatty acids, Chall lamb, Rumen pH