

EFFECTS OF FASTING AND XYLAZINE SEDATIVE ON DIGESTIVE TRACT MOTILITY, RUMEN VFA AND CERTAIN BLOOD COMPONENTS IN RUMINANTS

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Abstract. Contraction motions of the stomach, small intestine and gallbladder were monitored in three cows with or without administered xylazine during fasting for 48 h were monitored using force transducers sutured on the organs. The concentrations of blood components, plasma electrolyte, and free endotoxin in blood were measured. In addition, the pH, the concentration of the total volatile fatty acids (VFA) and VFA composition in the rumen liquor were determined. The following results were obtained in this study:

1. The intervals of phase III observed in the duodenum, jejunum and ileum were shortened and became irregular, and those of resting states observed in the pylorus and gallbladder were prolonged compared to those in physiological state. No significant change in motility was observed in the rumen or abomasum. 2. Under the influence of xylazine, the contraction motions in the rumen, gallbladder, descending portion of the duodenum, jejunum and ileum were suppressed, whereas those in the pylorus were stimulated. It took 1.5-2.0 hours more for recovery of the motility of the digestive tract compared to the time for the recovery in normal feeding. The motility of the digestive tract was not significantly different between the first and second days. 3. The concentration of the total protein in blood significantly increased, and the pH of blood significantly decreased with time of fasting. The number of red blood cells, hemoglobin concentration and hematocrit were slightly increased. The concentration of sodium ions in blood was slightly decreased. These values were not significantly changed by administering xylazine. 4. The concentration of free endotoxin in blood was varied in the range of 3.94 to 5.13 pg/ml during the two days. It was always within a normal range during fasting, even when administering xylazine. 5. The pH in rumen liquor markedly increased, and the concentration of the total VFA markedly decreased with time of fasting. The content of acetic acid, which constitutes the largest portion of the total VFA, was not markedly changed, but the ratio of acetic and propionic acids (A/P) was increased due to fasting-induced reduction in the content of propionic acid. The changes in content of butyric, isobutyric, valeric and isovaleric acids were less than 10 % of the normal. These values were not significantly changed by administering xylazine.

Our results indicated that the motility of the stomach and small intestine was suppressed mainly due to the change in the pH or concentration of the total VFA, and the influence of the change in the concentration of free endotoxin or blood components on the suppression of the motility could be relatively small. When administering a sedative, the time of the suppression of the motility was prolonged, suggesting that controlled feeding is necessary if homeostasis of the rumen is to be kept intact.

Keywords: cattle, fasting, xylazine, digestive tract, motility, VFA's