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In vivo Alterations in Ruminal Parameters by Megasphaera Elsdenii Inoculation on Subacute Ruminal Acidosis (SARA)

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Abstract : SARA is a common and serious metabolic disorder in early lactation in dairy cattle and in finishing beef cattle, caused by diets with high inclusion of cereal grain. This experiment was performed to determine the efficacy of Megasphaera elsdenii, a major lactate-utilizing bacterium in prevention/treatment of SARA in vivo. In vivo experimentation, it was used eight ruminally cannulated rams and it was applied the rapid adaptation with the mixture of grain based on wheat (%80 wheat, %20 barley) and barley (%80 barley, %20 wheat). During the systematic adaptation, it was followed the probability of SARA formation by being measured the rumen pH with two hours intervals after and before feeding. After being evaluated the data, it was determined the ruminal pH ranged from 5,2-5,6 on the condition of feeding with 60 percentage of grain mixture based on barley and wheat, that assured the definite form of subacute acidosis. In four days SARA period, M. elsdenii (1010 cfu ml-1) was inoculated during the first two days. During the SARA period, it was observed the decrease of feed intake with M. elsdenii inoculation. Inoculation of M. elsdenii was caused to differentiation of rumen pH ($P < 0,0001$), while it was found the pH level approximately 5,55 in animals applied the inoculation, it was 5,63 pH in other animals. It was observed that total VFA with the bacterium inoculation tended to change in terms of grain feed ($P < 0,07$). It increased with the effect of total VFA inoculation in barley based diet, but it was more stabilized in wheat based diet. Bacterium inoculation increased the ratio of propionic acid (18,33%-21,38%) but it caused to decrease the butyric acid, and acetic/propionic acid. During the rapid adaptation, the concentration of lactic acid in the rumen liquid increased depending upon grain level ($P<0,0001$). On the other hand bacterium inoculation did not have an effect on concentration of lactic acid. M. elsdenii inoculation did not affect ruminal ammonia concentration. In the group that did not apply inoculation, the level of ruminal ammonia concentration was higher than the others applied inoculation. M. elsdenii inoculation did not changed protozoa count in barley-based diet whereas it decreased in wheat-based diet. In the period of SARA, it was observed that the level of blood glucose, lactate and hematocrit increased greatly after inoculation ($P < 0,0001$). When it is generally evaluated, it is seen that M. elsdenii inoculation has not a positive impact on rumen parameters. Therefore, to reveal the full impact of the inoculation with different strains, feedstuffs and animal groups, further research is required.

Keywords : In vivo, Subactute ruminal acidosis, Megasphaera elsdenii, Rumen fermentation
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