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The Influence of Bacteriocins Producing Lactic Acid Bacteria Multiplied in an Alternative Substrate on Calves Blood Parameters

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Abstract : In calves less than 10-day-old, infection commonly cause severe diarrhoea and high mortality. To prevention of calves diseases a common practice is to treat calves with prophylactic antibiotics, in this case the use of lactic acid bacteria (LAB) is promising. Often LAB strains are incubated in comercial de Man-Rogosa-Sharpe (MRS) medium, the culture are centrifuged, the cells are washing with sterile water, and this suspension is used as a starter culture for animal health care. Juice of potatoe tubers is industrial wastes, wich may constitute a source of digestible nutrients for microorganisms. In our study the ability of LAB to utilize potatoe tubers juice in cell synthesis without external nutrient supplement was investigated, and the influence of multiplied LAB on calves blood parameters was evaluated. Calves were selected based on the analogy principle (treatment group (n=6), control group (n=8)). For the treatment group 14 days was given a 50 ml of fermented potatoe tubers juice containing 9.6 log10 cfu/ml of LAB. Blood parameters (gas and biochemical) were assessed by use of an auto-analyzers (Hitachi 705 and EPOC). Before the experiment, blood pH of treatment group calves was 7.33, control – 7.36, whereas, after 14 days, 7.28 and 7.36, respectively. Calves blood pH in the treatment group remained stable over the all experiment period. Concentration of PCO2 in control calves group blood increased from 63.95 to 70.93, whereas, in the treatment group decreased from 63.08 to 60.71. Concentration of lactate in the treatment group decreased from 3.20 mmol/l to 2.64 mmol/l, whereas, in control - increased from 3.95 mmol/l to 4.29 mmol/l. Concentration of AST in the control calves group increased from 50.18 IU/L to 58.9 IU/L, whereas, in treatment group decreased from 49.82 IU/L to 33.1 IU/L. We conclude that the 50 ml of fermented potatoe tubers juice containing 9.6 log10 cfu/ml of LAB per day, by using 14 days, reduced risk of developing acidosis (stabilizes blood pH ($p < 0.05$)), reduces lactates and PCO2 concentration ($p < 0.05$) and risk of liver lesions (reduces AST concentration ($p < 0.005$)) in blood of calves.

Keywords : alternative substrate, blood parameters, calves, lactic acid bacteria
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