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The effect of supplemented diet by sucrose and/or starch on *Fibrobacter succinogenes* population in ruminal fluid of Holstein steers determined by real-time PCR

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The objective of the present study was to investigate the effect of diets containing different types of non-fiber carbohydrates (NFC) on ruminal *Fibrobacter succinogenes* (FBS) population determined by real-time polymerase chain reaction (RT-PCR). Four Holstein steers were used in a 4×4 Latin square design (21 days each period). A basal diet (BD) was formulated to be contained of alfalfa hay, barley grain, soybean meal and sugar beet pulp (400, 290, 190 and 50 g/kg, respectively). Sucrose (Su) or starch (St) or a 1:1 mixture of sucrose and starch (SuSt) was added to the BD at the rate of 70 g/kg DM. Diets were offered as 2-2.5 times of maintenance requirements (7 kg DM/d). Rumen fluid samples were collected before and 4 h after the morning feeding at the last day of each period. Samples were analyzed for FBS quantitation by qPCR. DNA was extracted from the samples using the QIAamp® DNA stool mini kit (Qiagen Ltd, Crawley, West Sussex, UK). *Fibrobacter succinogenes* rDNA concentration was measured by RT-PCR relative to total bacteria amplification ($\Delta\Delta Ct$). The 16s rRNA gene-targeted primer sets used in the present study were forward: GTTCGGAATTACTGGGCGTAAA and reverse: CGCCTGCCCCCTGAACTATC. Cycling conditions were 95 °C for 5 min, forty cycles of 95 °C for 15 s, 60 °C for 15 s and 72 °C for 30 s. Mixed procedure of SAS (2003; $Y = \text{Mean} + \text{Treatment} + \text{Animal} + \text{Period} + \text{residual}$) was applied to analyzed the data, and the means compared by Tukey test ($P < 0.05$). The results indicated that different types of non-fiber carbohydrates did not have any effect on FBS population relative to total bacterial population ($\Delta\Delta Ct$) in ruminal fluid before and 4 h after the morning feeding (BD = 0.193 and 0.179, Su = 0.179 and 0.230, St = 0.123 and 0.144, SuSt = 0.0911 and 0.189, SEM = 0.0629 and 0.054, respectively).

Effects of combination of ethylene di amine tetra acetic acid and microbial phytase on the serum concentration and digestibility of some minerals in broiler chicks

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This experiment was conducted to evaluate the combined effects of ethylene di amine tetra acetic acid (EDTA) and microbial phytase (MP) on the serum concentration and digestibility of some minerals in broiler chicks. This experiment was conducted using 360 Ross-308 broiler chicks. In a completely randomized design with a 3×2 factorial arrangement (0, 0.1 and 0.2% EDTA and 0 and 500 IU MP). Four replicate of 15 chicks per each were fed dietary treatments including 1) P-deficient basal diet [0.2% available phosphorus (aP)] (NC); 2) NC + 500 IU MP per kilogram of diet; 3) NC + 0.1% EDTA per kilogram of diet; 4) NC + 0.1% EDTA + 500 IU MP per kilogram of diet; (v) NC + 0.2% EDTA per kilogram; and (vi) NC + 0.2% EDTA + 500 IU MP per kilogram of diet. The concentration of zinc, copper and manganese of serum and their digestibility and also digestibility of apparent metabolizable energy (AMEn) was evaluated. The results showed that phytase supplementation of P-deficient diets significantly increased zinc concentration of serum ($P < 0.05$). Interaction effect of EDTA×MP on serum concentration of copper and manganese and also digestibility of zinc was significant ($P < 0.05$). EDTA supplementation of P-deficient diets significantly increased manganese digestibility in broiler chicks ($P < 0.01$).