

Bacillus coagulans supplementation in Holstein Friesian female calves' diet

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After birth, twenty animals were divided into two groups: a control group (CTR) fed a basal diet, and a treatment group (T) fed a concentration of 10⁹ CFU/kg of *Bacillus coagulans* DSM32016 (Technospore®). Trial started at 7 d of life (0 d of trial) and lasted 56 d. Colostrum was sampled at 6-12 hours after birth. Body weight (BW) evaluation, blood, and fecal sampling were performed at 0, 28 and 56 d. Plasma glucose, non-esterified fatty acids (NEFA), beta-hydroxybutyrate (BHB), IgG and serum total antioxidant capacity (T-AOC) were analysed. Data were analyzed with a two-way ANOVA and a Bonferroni test. Fecal samples were analyzed through 16S rRNA-gene sequencing. MetaCyc database was used for functional prediction, followed by a Bonferroni-Dunn evaluation. Colostrum IgG showed levels above 50 g/l. BW was higher in T vs CTR at 56 d ($p < 0.05$). Plasma metabolites were not conditioned by the treatment. Serum T-AOC increased in T vs CTR at 56 d ($p < 0.05$). β -diversity revealed differences between T and CTR at 28 and 56 d ($p < 0.05$). *Bifidobacterium*, *Prevotella* 9 and *Fusicatenibacter* were more abundant in T vs CTR at 56 d ($p < 0.05$). Starch degradation and L-isoleucine biosynthesis pathways significantly increased over time in T and were correlated with the cited taxa at 56 d ($p < 0.05$). The supplementation of *Bacillus coagulans* DSM32016 ameliorated growth and serum T-AOC of calves, revealing its capacity to modulate potentially useful microbial niches.