

Drinking water supplement containing organic acids and medium chain fatty acids induces significant changes in the intestinal microbiota and lowers incidence of diarrhoea of piglets post-weaning

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Abstract

Antibiotic treatment of piglets post-weaning may lead to re-occurring diarrhoea after stopping the antibiotic treatment. The objective of the study was to test the efficacy of a commercial drinking water supplement containing organic acids and medium chain fatty acids (Selko-4-Health[®]) on diarrhoea control in piglets weaned at 26 days of age. In total 244 piglets were allocated at weaning to 4 treatments in a 2x2 experimental design for the duration of 4 weeks. Piglets received either a non-medicated feed, oxytetracycline medicated feed (400 ppm) during the first week post weaning and thereafter no medication, a drinking water supplement during the whole experimental period or the combination of the two treatments. Jejunal samples were taken of 4 piglets from each treatment at 2 and 4 weeks post-weaning to examine the intestinal microbiota with 16S rRNA gene-targeted Denaturant Gradient Gel Electrophoresis, quantitative PCR and the Pig Intestinal Tract Chip (PITChip), a diagnostic microarray custom-designed for the profiling of porcine intestinal microbiota. None of the treatments significantly affected performance. Both, the antibiotic treatment as the water supplement treatment significantly lowered the incidence of diarrhoea in week 2 and 3 post-weaning and in the overall experimental period ($p < 0.05$), with no significant interaction between these treatments. The microbiota assays revealed a shift of the microbial profiles in time. Overall, the organic acid blend as well as oxytetracycline had a significant effect on weaned piglet gut microbiota, with observed changes in Lactobacilli spp. composition (DGGE) and microbial profiles analysed with the PITChip. The results demonstrate that drinking water supplements containing organic acids and medium chain fatty acids can be applied in strategies to establish a prudent use of antibiotics in control of diarrhoea in piglets. More information is needed to understand the impact of intestinal microbiota changes in relation to occurrence of diarrhoea in piglets.