ALGINITE AS SUITABLE COMPOUND FOR COMBINATION WITH LACTOBACILLUS FERMENTUM CCM 7421 IN DOGS

Kubašová I., Strompfová V., Farbáková J., Maďari A., Gancarčíková S., Mudroňová D., Lauková A.
Institute of Animal Physiology Slovak Academy of Sciences, Slovak Republic

Introduction:
Alginite is a loam-like material formed by an accumulation of organic material (algae) and inorganic material (mainly clays and volcanic materials) rich in minerals and trace elements (Litavec and Barančíková, 2013). So far it has been used to improve soil structure, moisture and nutrient content as well as growth of plants within agriculture and forestry (Kulich et al., 2001). Alginite has not been studied as feed additive in animals until now and therefore there are no information on its antimicrobial or physiological effects in organism. Our aim was to test effects of this organic rock alone or in combination with probiotic strain to avoid possible side-effects observed after long-term probiotic application resulting from overproduction of organic acids (Ku et al. 2006; Munakata et al. 2010).

Methods:
Healthy dogs (n=40, 25 males, 15 females) were devided in 4 experimental groups, 10 animals in each (C-control, A-alginite 0.3 g/kg BW/day, LF-Lactobacillus fermentum CCM 7421 1.2x108 CFU/dog/day, A+LF-both additives). The application period lasted 14 days; faecal samples were taken at day 0, 7, 14 and 35. For microbial analysis, standard ten-fold dilution method and selective media were used (MRS, MacConkey agar, M-Enterococcus agar, Becton and Dickinson; TOS-propionate agar, Merck; Clostridium difficile agar, Oxoid). Plates were incubated at 37 °C for 24-48 h, clostridia and bifidobacteria anaerobically for 48-72 h. Faeces was scored visually (from 1-hard to 5-liquid). Organic acid analysis was measured by capillary isotachophoresis (ZKI 01, Slovakia). Statistic: repeated-measures ANOVA - Dunnett’s post test.

Results:
Oral supplementation with alginite for 14 days led to a significantly higher population of Clostridium-like bacteria during the treatment period compared to initial numbers at day 0 (P<0.05). In contrast, a decrease of Clostridium-like bacteria was detected in combined A+LF group (P<0.05) and in LF group (P<0.01). The population of coliform bacteria was decreased only in the A+LF (P<0.01) and with trend noted in the LF group (P=0.08) at day 14. The population of lactic acid bacteria increased in all experimental groups (P<0.05 in the A and LF group, P=0.09 in A+LF) at day 7 or 14. The faecal level of probiotic strain ranged from 103-106 CFU/g in the A+LF and in levels of 104-106 in the LF group. No effect of alginite or probiotic supplementation was noted on the consistency of faeces and faecal dry mater. The faecal pH values indicated a trend to decrease only in the LF group (P=0.08) with the lowest values detected at day 14.

Discussion:
It seems alginite has no antimicrobial rather the opposite stimulatory effect on the abundance of certain intestinal bacterial groups. Although no evidence on antimicrobial or stimulatory effect of alginite on the abundance of intestinal bacteria exist, an improvement of microbial activity indicators of forest soil (basal respiration, catalase activity) was reported by Gömöryová et al. (2009). Buffering or alkalizing effect of alginite in combined group was observed and thus could contribute to maintenance of acid-base balance. VEGA 2/0012/16

Keywords: Lactobacillus, Probiotic, Alginite, Microflora, Dog