Effects of Probiotic and Heat-Killed Probiotic Supplementation on Systemic Biomarkers of Oxidative Stress and Inflammation and Fermentative end Products of Adult Cats.

Abstract: Probiotics and heat-killed probiotics (postbiotic) have been linked with enhancement of the intestinal barrier function and mucosal immunity, anti-inflammatory properties, as well as production of fermentative end-products including short-chain fatty acids (SCFA), which may confer benefits to the gut microbiome and health. This study aimed to evaluate the longitudinal effects of daily supplementation of pro- and post-biotics on oxidative stress biomarkers such as malondialdehyde (MDA) and superoxide dismutase (SOD), inflammatory biomarkers from a panel of 19 cytokines and chemokines, the hormone leptin, as well as the fecal metabolites, such as phenol and indole, SCFA, and ammonia, of adult cats. The study was a complete randomized design with 36 cats divided into 3 treatments (n=12/treatment). Animals were fed a standard extruded commercial diet. The treatments used were control diet + placebo (maltodextrin carrier; CON), control diet + Probiotic (Bifidobacterium animalis subsp. Lactis CECT8145; daily dosage: 109CFU/cat; PRO), and control diet + postbiotic (Heat-killed Bifidobacterium animalis subsp. lactis CECT8145; daily dosage: 109CFU/cat; PST). Test articles were supplied by ADM Biopolis (Valencia, Spain). Longitudinal analyses were performed every 30 days for a total of 90 days. No interaction of day by treatment (P >0.05) was observed for any of the variables evaluated. For fecal metabolites, there was a main effect of treatment for butyrate concentration, PST was greater (P< 0.05) than PRO. It was also observed a main effect of treatment for some cytokines and chemokines, cats on CON had reduced (P< 0.05) GM-CSF, KC, and SDF-1, when compared with PST, PRO, and both PST and PRO respectively. Whilst for RANTES and IL-12(p40), cats on CON had greater concentration (P< 0.05) when compared with cats on PST and PRO, and PST, respectively. Overall, the supplementation of the probiotic and postbiotic showed no detrimental effects on oxidative stress and inflammatory biomarkers, and fermentative end-products in adult cats.

Keywords: feline, postbiotic, probiotic

The Effects of Dietary Phenylalanine on Gastric Emptying, Macronutrient Metabolism and Feed Intake in Healthy Adult Cats.

Abstract: Phenylalanine (Phe) consumption may delay gastric emptying (GE) and feed intake. Two studies were conducted using a 2*2 latin square design with 12 healthy male cats to evaluate effects of 1) dietary Phe (PHE, 44mg/kg-BW) compared with an isonitrogenous amount of alanine (ALA, 23.7 mg/kg-BW) on feed intake, and 2) PHE and ALA on GE and GE rate (GER). In study 1, cats were given PHE or ALA 15 minutes before 120% of their daily food and intake was measured. Treatment, day, and their interaction were evaluated using PROC GLIMMIX in SAS. Treatment did not affect rate of food consumption (p >0.05). For study 2, cats were provided PHE or ALA 15 minutes before receiving 100% of their daily food intake for 3 days. On d4, cats received PHE or ALA and subsequently received [1-13C] octanoic acid (5mg/kg BW) on 10g of feed before being fed 50% of their daily food intake. Breath samples were collected to measure 13CO2 enrichment for 12 hours post-meal using indirect calorimetry. Data from cats that returned to baseline enrichment were evaluated for total AUC (GE) and time to peak enrichment (GER). The effect of treatment, body condition score (lean vs. overweight), and their interaction were evaluated using PROC GLIMMIX in SAS. Cats receiving PHE had later peaks (445±71 min) in 13CO2 enrichment (p< 0.05) than cats receiving ALA (242±71 min) but had similar total GE (p >0.10). Obese cats tended (P=0.09) to have greater total GE than lean cats, regardless of treatment. Lean cats on PHE had slower (p< 0.05) emptying rates than lean cats on ALA, but both were similar to obese cats (p >0.05). Overall, Phe did not reduce feed intake or total GE but did delay GE and thus reduced GER. A longer study is warranted to understand whether PHE can control food intake in cats.

Keywords: cat, gastric emptying