VIII. ABSTRACT

This study was carried out to assess the possibility of using gas production technique to evaluate canine diet and to assess the changes in hindgut microbial population of dogs fed different diets. The experiment comprised of in vitro digestibility, hindgut fermentation and total gas measurement, and enumeration of fecal microbiota. Four adult maintenance type canine diets viz. homemade vegetable (HV), homemade non vegetarian (HNV), commercial vegetable (CV) and commercial non vegetarian (CNV) were selected. In vitro digestibility was completed by incubating the food samples with enzymes (pepsin, amylase and pancreatin) to simulate digestion in the stomach and small intestine. The residue obtained from enzymatic digestion was subjected to in vitro gas test to simulate the hindgut fermentation. Fecal samples from dogs fed experimental diets were used as the source of inoculum for incubating the food samples in gas production test. The fecal samples obtained from dogs fed different experimental diets were subjected for bacterial enumeration (Coliforms, Streptococci, Lactobacilli, Clostridia, Bifidobacteria, Bacteroides and Total anaerobes) by pour plate and spread plate methods. The in vitro digestibility (%) of DM, CP and CF of CV (85.51, 89.68 and 69.63 respectively) and CNV diet 84.35, 89.74 and 69.16 respectively) were higher than HV (81.85, 81.20 and 13.65 respectively) and HNV diet (88.85, 86.15 and 46.43 respectively) (p<0.05). Fat digestibility (%) was higher in HV (82.81) and HNV (92.71) compared with CV (65.29) and CNV (36.84). The food residue after enzymatic digestion available for microbial fermentation was higher (p<0.05) in HV which resulted in higher gas production (37.70 mL/ g DM of food) compared to HNV (31.29), CV (12.37) or CNV (5.79) diets. The higher crude fat content (%) of the residue after enzymatic digestion in the CV (23.91) and CNV (50.94) diets might lead to the decreased gas production. It was concluded that the gas production technique can be used to evaluate canine diet and enumeration of total anaerobic bacteria may not reflect the fermentation characteristic of hindgut, while the enumeration of Bacteroides species can be microbiological index to reflect the fermentation and hindgut health of dogs.