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Abstract: Yeast extract is rich in nutrients, including amino acids, nucleic acids, and B vitamins, which can contribute to the intestinal health of dogs. This study aimed to evaluate the effects of yeast extract supplementation on diet digestibility, fecal characteristics, and intestinal fermentation metabolites in dogs. The analyses of diet digestibility, fecal concentrations of short-chain and branched-chain fatty acids and ammonia, fecal pH, score (1 = liquid and 5 = dry), dry matter (DM), and production were conducted using 12 adult Beagle dogs, randomly distributed into two diets containing 0% and 2% yeast extract (n = 6/treatment). The dogs were fed the experimental diets for 25 days of adaptation, followed by 5 days of total fecal collection. The 2% yeast extract diet reduced crude protein digestibility ($P < 0.05$) but did not influence other apparent digestibility coefficients ($P > 0.05$). However, the diet with the inclusion of 2% yeast extract increased fecal concentrations of acetate ($P < 0.05$) and improved fecal score ($P < 0.05$). In conclusion, dietary supplementation of 2% yeast extract improved fecal concentrations of acetate and fecal consistency, without affecting the digestibility of most diet fractions in dogs.

Keywords: Prebiotic, *Saccharomyces cerevisiae*, Short-chain fatty acids.

1. Introduction

Dogs are often exposed to stressful daily situations, such as sudden dietary changes, the onset of illnesses, and the administration of medications. These factors can negatively affect the gut microbiome and its metabolite composition. Consequently, potentially pathogenic bacteria proliferate, and protein fermentation metabolites are produced, which can impair diet digestibility, the immune system, and nutritional support for enterocytes (Masuoka et al., 2017; Chaitman et al., 2020). Functional additives, such as prebiotics, have been studied to mitigate these effects, demonstrating their ability to modulate the intestinal microbiota and its metabolites in dogs (Bastos et al., 2023).

Prebiotics can be defined as substrates that selectively stimulate the growth and/or activity of certain groups of bacteria in the gut (Gibson et al., 2017). In addition, prebiotics can contribute to increasing dietary utilization by reducing fecal nitrogen excretion (Perini et al., 2023). Among prebiotics, yeast-derived products are especially notable, as they can contribute to the intestinal functionality of dogs (Kaelle et al., 2022). In this context, yeast extracts from *Saccharomyces cerevisiae* are particularly relevant. These extracts are obtained by autolysis of yeast cells, followed by separation and concentration of soluble components, including cytoplasm and yeast cell wall soluble fractions (Borchani et al., 2014). The yeast cell wall contains 20-30% mannanoligosaccharides (MOS), which can modulate the intestinal microbiota through interaction with pathogens, reducing the formation of nitrogen fermentation compounds (Félix et al., 2009) and possibly increasing the production of short-chain fatty acids (SCFA) (Van den Abbeele et al., 2020; Kaelle et al., 2022). A study comparing a more soluble yeast cell wall preparation with conventional yeast cell wall preparation observed that the soluble fraction used resulted in greater fecal concentrations of fermentation metabolites in dogs (Theodoro et al., 2019). Thus, it is expected that yeast extract contributes to the improvement of digestibility and the production of fermentation metabolites in the gut. Therefore, this study aimed to evaluate the effects of *Saccharomyces cerevisiae* extract on diet digestibility, metabolizable energy, intestinal fermentation metabolites, and fecal characteristics of healthy dogs.

2. Materials and Methods

All animal procedures were approved by the Ethics Committee on Animal Use of the Agrarian Sciences Sector at the Federal University of Paraná, Curitiba, Paraná, Brazil, under protocol number. 054/2017. The study was conducted at the Research Laboratory in Canine Nutrition – LENCAN in Curitiba, Paraná, Brazil (25° 25' 40" S, 49° 16' 23" W).

2.1. Animals and facilities

Six male and six female adult dogs (2 years old), weighing 10.3 ± 1.07 kg, were used. The body condition score (BCS) of the dogs was analyzed at the beginning and end of the trial, on a scale of 1 to 9 (Laflamme 1997). The dogs had a mean BCS of 5.2 ± 0.1

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