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Probiotics and Prebiotics

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Probiotics (often referred to as direct-fed microbials) are beneficial bacteria that can be incorporated into the diet through foods that contain live cultures (such as yogurt), or through supplemental form (powders and/or liquids). Probiotics come from the natural "flora" within the gastrointestinal (GI) tract. When supplemented in the diet, probiotics are thought to help populate the GI tract with beneficial bacterial species. Prebiotics include fermentable fibers and oligopolysaccharides that are preferentially used by beneficial bacteria as a food source within the GI tract, and help to promote a gastrointestinal environment that allows beneficial bacteria to thrive. When probiotics and prebiotics are used together, the term synbiotics is often used to describe the synergistic relationship.

Probiotics are commonly known for helping to maintain GI health, but research in recent years has identified additional benefits such as reducing inflammatory cytokines and supporting immune function.[1,2] A variety of probiotic species have been evaluated in dogs and cats, including multiple species (spp.) and strains of *Lactobacillus, Bifidobacterium*, and *Enterococcus*.[1-8] When supplemented with foods, care must be taken to ensure viability of the probiotic with careful management of application and species selection. *Bifidobacterium* spp. have been shown to be beneficial; however, because they may have poor viability they are not routinely utilized for food supplementation. Probiotic cocktails have been shown to be more efficacious than single strains in certain circumstances; therefore, it may be beneficial to use a combination of three or more organisms in some probiotic applications.[1] Although there is growing interest in developing probiotics specific to canine and feline species,[1,5,9] multiple studies have shown that adhesion of probiotic bacteria to intestinal mucosal cells is not species specific.[10-11] Therefore, pets may benefit from being fed probiotics that originate from other species.

As mentioned above, prebiotics include fermentable fibers and oligopolysaccharides that can be utilized in the diet to promote beneficial bacteria, helping to establish and maintain these favored species within the intestinal flora. When prebiotics are fermented by bacteria within the GI tract, short-chain fatty acids (SCFA) are produced. SCFA's have many known benefits, including serving as a source of energy to large intestinal cells, maintaining intestinal motility, and reducing intestinal inflammation and pathogenic bacterial overgrowth.[12] In addition, feeding prebiotics has been shown to reduce negative fecal odors through the reduction of ammonia and phenol compounds.[13] Certain dietary fiber types, such as chicory and pea fiber, have been shown to promote beneficial bacteria such as *Bifidobacteria* within the GI tract, while reducing potentially harmful bacteria such as *Clostridum*.[14-15]

Both probiotics and prebiotics can be used in pet foods to help promote a healthy GI tract and overall well-being. Used together, probiotics and prebiotics have a synergistic effect, helping to optimize the health benefits for both dogs and cats.

If you have questions about Natura products, please contact our product advisors at 800-532-7261 or visit us online at naturapet.com.

References

1. Sauter SN, et al. Cytokine expression in an ex vivo culture system of duodenal samples from dogs with chronic enteropathies: Modulation by probiotic bacteria. *Domestic Animal Endocrinology* 2005; 29: 605-622.; 2. Benyacoub J, et al. Supplementation of Food with *Enterococcus faecium* (SF86) Stimulates Immune Functions in Young Dogs. *J Nutr* 2003; 133: 1158-1162.; 3. Marshall-Jones ZV, et al. Effects of probiotic Lactobacillus acidophilus DSM13241 in healthy adult dogs. *Am J Vet Res* 2004; 65: 338-343.; 4. Marshall-Jones ZV, et al. Effects of Lactobacillus acidophilus DSM13241 as a probiotic in healthy adult cats. *Am J Vet Res* 2006; 67: 1005-1012. 5. Manninen TJK, et al. Alteration of the canine small-intestine lactic acid bacterium microbiota by feeding potential probiotics. *Applied and Environmental Microbiology* 2006; 72(10):6539-6543.; 6. Biagi G, et al. Effect of Lactobacillus animalis strain on composition and metabolism of the intestinal microflora in adult dogs. *Veterinary Microbiology* 2007; 124: 160-165.; 7. Vahjen W, et al. The effect of a probiotic *Enterococcus faecium* product in diets of healthy dogs on bacteriological counts of *Salmonella spp., Camplobacter spp.*, and *Clostridium spp*. in faeces. *Arch Anim Nutr* 2003; 57(3): 229-233.; 8. Rinkinen M, et al. Interaction between probiotic lactic acid bacteria and canine enteric pathogens: a risk factor for intestinal *Enterococcus faecium* colonization? *Veterinary Microbiology* 2003; 92, 111-119.; 9. O'Mahony D, et al. Portrait of a canine probiotic *Bifidobacterium* – From gut to gut. *Veterinary Microbiology* 2009; 139: 106-112.; 10. Lauková A, et al. Adhesion properties of Enterococci to intestinal mucus of different hosts. *Veterinary Research Communications* 2004; 28: 647-655.; 11. Rinkinen M, et al. Absence of host specificity for in vitro adhesion of probiotic lactic acid bacteria to intestinal mucus. *Veterinary Microbiology* 2003; 97: 55-61.; 12. Sanderson SS. Why "Biotics"? Using Prebiotics and Probiotics in Your Practice. *Compendium* 2009; 31(12A): 22S-24S.; 13. Propst EL, et al. A dose-response experiment evaluating the effect of oligofructose and inulin on nutrient digestibility, stool quality, and fecal protein catabolites in healthy adult dogs. *J Anim Sci* 2003; 81: 3057-3066.; 14. Zentek J, et al. Dietary effects on bifidobacteria and *Clostridum perfringens* in the canine intestinal tract. *J Anim Phyriol Anim Nutr* 2003; 87: 397-407.; 15. Iwata E, et al. The screening method of a bifidogenic dietary fiber extracted from inedible parts of vegetables. *J Nutr Sci Vitaminol* 2009; 55: 385-388.