

**Gastrointestinal Disorders**

INTESTINAL DYSBIOSIS IN DOGS AND CATS



The gastrointestinal (GI), or gut, microbiome plays an important role in the GI tract health of cats and dogs.

Research shows the gut microbiome – or more specifically, alterations in the gut microbiome – may cause or be caused by GI disorders. Nutritional interventions, such as diet modifications, prebiotics and/or probiotics, are an important part of a multimodal therapeutic approach to managing dogs and cats with clinical signs of dysbiosis.

Key Messages

- Intestinal, or gut, dysbiosis is defined as changes in the make-up and/or diversity of the intestinal microbiota that affect its function (e.g., reduced production of short-chain fatty acids and other metabolites, altered bacterial enzyme pool, and/or disruption of the intestinal barrier).⁹⁻¹¹ Dysbiosis may be localized to one area or may occur along the entire GI tract.
- Four major dysbiosis patterns, which can overlap in the same patient, have been identified in dogs and cats:¹¹
 - The presence of an abnormal substrate in the intestinal lumen, such as undigested nutrients or medications, can result in an increase in microbial metabolites that contribute to diarrhea.
 - A loss of beneficial commensal bacteria can result in decreased beneficial microbiota functions such as conversion of primary to secondary bile acids and production of anti-inflammatory bacterial metabolites.
 - Increased total bacteria numbers, particularly in the small intestine, can lead to greater production of toxic metabolites and/or release of bacterial toxins and increased inflammation.
 - Greater numbers of invasive or mucosa-adherent bacteria can produce an increased inflammatory response in the intestinal mucosa.

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DID YOU KNOW?

Many dogs and cats with GI disease have concurrent dysbiosis.¹⁻⁸ Dysbiosis has been identified in dogs with both acute and chronic GI conditions (e.g., acute diarrhea and chronic enteropathy [CE]),¹⁻⁵ cats with CE,^{6,7} and dogs and cats with *Giardia duodenalis* infections.⁸

Key Messages (continued)

- Although there are many conditions that may contribute to dysbiosis, in any individual patient, it may be unclear if dysbiosis caused the GI disease or is a consequence of it.¹¹
- Dysbiosis-related GI signs vary with the location of the dysbiosis (e.g., stomach, small intestine, colon or throughout the intestinal tract) and extent of microbiome changes. Signs can range from mild to severe acute or chronic GI signs, including diarrhea, vomiting, decreased appetite, and weight loss. Pets with dysbiosis also can be asymptomatic.
- Since intestinal dysbiosis occurs with various GI diseases, restoring normal microbiome composition and function is an important therapeutic goal – in addition to managing or treating any underlying GI condition.
- Common nutritional strategies for altering the intestinal microbiome include dietary modifications and administration of prebiotics, probiotics or synbiotics.^{11,12}
 - A highly digestible diet reduces the availability of undigested nutrients for fermentation by the gut microbiota and possible bacterial overgrowth.¹¹
 - For patients with chronic enteropathy from suspected food allergy or sensitivity, a hydrolyzed or novel protein diet may reduce intestinal inflammation, an important driver of dysbiosis.¹¹
 - Prebiotics, specific soluble fibers that can be fermented by bacteria in the colon, can help recover beneficial bacterial populations, restore short-chain fatty acid production and lower intestinal lumen pH.
 - Although probiotics may only transiently colonize the GI tract, they can still produce beneficial metabolites that help improve clinical signs.¹³ Since different probiotic strains have varying effects on the host, specific probiotics should be chosen based on the desired goals.

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