Key to Growth of "bad" Bacteria in the Intestine

By Susan Lauten, PhD

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UC Davis Health System published the results of two researchers into how "bad" bacteria take hold and overpower the healthy bacteria in the intestine. This article is based upon the results of their work and the published article. Direct quotes will be used when paraphrasing is not possible.

Sensitive stomachs, intermittent diarrhea, and/or days of poor appetite can all be symptoms of the disease called inflammatory bowel disease. The disease is really an enteritis (inflammation of the enteric system) that can affect the entire small intestine as well as the large intestine and colon, and many dogs also suffer from gastric, or stomach symptoms, called gastritis. Simple, periodic bouts of diarrhea, etc, do not mean that your dog has IBD. The disease can take different forms such as one where food sensitivities cause enteritis, or inflammation of the intestine and/or an immune mediated form of the disease (Rheumatoid arthritis, Chron's disease, ulcerative colitis, and lupus are examples of immune mediated diseases).

One thing in common in inflammatory bowel disease is that the normal gut flora, or bacterial populations become depleted while bad, inflammation-causing bacteria flourish. Prior to now, no one knows how or why this happens. Drs. Winter and Baumler at UC Davis have "found a key to the growth of the bad bacteria."

Involvement of the immune system in this process results in the immune system mistakenly killing off the good bacteria, while the harmful bacteria thrive. These scientists have found a harmful bacterium called Enterobacteriaceae in the GI tracts of affected animals and humans. This bacteria uses nitrate, a byproduct formed during intestinal inflammation to grow and thrive. Enterobacteriaceae strains include certain E. coli bacteria which "can worsen the intestinal damage of IBD." Later, the good bacterial populations are crowded out and decrease. The harmful bacteria utilize nitrate for oxygen to produce energy and grow, perpetuating the cycle of damage to the intestinal tissue. This happens because the damaged intestinal tissue produces nitric oxide to kill off the bad bacteria. However, this unstable molecule quickly degrades to nitrate or food for the bad bacteria. "By contrast, good bacteria in the gut grows through fermentation—a much slower process.

They are already testing a drug that could stop the pathways by which harmful bacteria survive and reproduce in IBD. "Essentially, you could then smother the bad bacteria."

If you have a dog with IBD, it can be a mild case or a severe case; sometimes fatal. Our Weimaraners get IBD and the numbers of cases increase annually. If you have lots of GI issues with your dog and haven't investigated why, you may wish to pursue diagnostics with an Internal Medicine Specialist. For those of us with IBD dogs, there is hope, maybe soon, for both the dogs and the families of affected animals.