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Dog Tips

Diarrhea Dilemma: Do Antibiotics Really Help Fix This?

A recently published study adds to the growing body of evidence about the effectiveness of antibiotics as treatment for diarrhea in dogs.

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STORY AT-A-GLANCE

- A recently published study from the U.K. adds to the growing body of evidence that antibiotics are not an effective treatment for acute diarrhea in dogs
- The study concluded that 90% of dogs recover from uncomplicated diarrhea regardless of what treatment they receive, and that 'evidence-free' antibiotic use contributes to antimicrobial resistance
- Veterinarians In the U.S. are also beginning to accept that antibiotics typically don't help, and often exacerbate chronic or repeated episodes of acute diarrhea in otherwise healthy animals
- In treating otherwise healthy patients with diarrhea, in my experience, the most effective first step, and the step most likely to provide long-term resolution of the condition, is to address the diet

Researchers in the U.K. have recently added to the growing body of evidence showing that antibiotics are not an effective treatment for diarrhea in dogs. Their "causal inference" study results, published in PLOS One, provide evidence that the use of antibiotics for uncomplicated diarrhea in dogs should be restricted.[1]

(According to the International Encyclopedia of the Social & Behavioral Sciences (Second Edition), 2015, "Causal inference refers to an intellectual discipline that considers the assumptions, study designs, and estimation strategies that allow researchers to draw causal conclusions based on data."[2])

Evidence-Free Antibiotic Use Fosters Antimicrobial Resistance

The Royal Veterinary College (RVC) research team used VetCompass data (VetCompass is a large veterinary database shared by U.K. vet practices) in an effort to assess the effectiveness of two treatments for dogs with acute diarrhea:

1. Antibiotics
2. Gastrointestinal (GI) nutraceuticals (dietary supplements)

According to a report by the University of Minnesota's Center for Infectious Disease Research and Policy (CIDRAP), the RVC researchers "used a 'target trial' design, which applies principles from randomized controlled trials to the analysis of observational data for causal inference."[3]

The study authors noted that despite little evidence that antibiotics are effective as a treatment for uncomplicated diarrhea in dogs, and despite guidelines from the British Small Animal Veterinary Association that state dogs with acute GI signs don't require antibiotics, over half of dogs with the condition are prescribed such drugs, most

commonly, metronidazole.

> *"This type of evidence-free antibiotic use, they add, raises concerns about promoting antimicrobial resistance, and the potential for negative impacts on the canine gut microbiome," writes Chris Dall, MA, a reporter for CIDRAP.*[4]

And according to the study authors:

> *"Given the current available evidence, high prescription rates of antimicrobials for acute diarrhoea is concerning."*[5]

90% of Dogs Recover, Regardless of the Treatment Given

For their study, the research team analyzed data on dogs between the ages of 3 months and 10 years who were brought to a veterinarian with acute diarrhea in 2019. There was a total of 894 dogs in the emulated trial; 355 were prescribed antibiotics and 539 were not prescribed antibiotics. The primary outcome the team looked for was no repeat visits for continued diarrhea within 30 days, i.e., clinical resolution.

The researchers also compared clinical resolution in 597 dogs prescribed GI nutraceuticals and 297 not prescribed GI nutraceuticals. The results showed there was barely measurable difference in clinical resolution between the dogs who received antibiotics (88.5%) and those who didn't (87.4%).

> *"The findings support the recommendation for veterinary professionals to limit antimicrobial use for acute diarrhoea in dogs," the authors concluded.*

The difference in clinical resolution in dogs treated with GI nutraceuticals and those who weren't treated was also considered non-significant.

Bottom line, most dogs in the study didn't return for a follow-up vet visit for diarrhea, regardless of what treatment they received. Almost 9 out of 10 recovered after the first visit. These findings further support the recommendation to veterinarians to limit the use of antibiotics to treat acute diarrhea in dogs.

> *"During 20 years as a veterinarian in first opinion practice, I was crying out for good evidence that could help me to provide better care for my patients for common conditions in dogs such as diarrhoea," Dan O'Neill, MVB, PhD, study co-author and an associate professor of companion animal epidemiology at the RVC said in a news release. "Veterinarians and owners can now feel confident that science is working better for them and their dogs — and that antibiotics are not needed to successfully manage cases of uncomplicated diarrhoea in dogs."*[6]

U.S. Veterinarians May Also Be Waking Up

While the study discussed above is from the U.K., about a year ago, I ran across an article in the AVMA (American Veterinary Medical Association) News that hinted at the beginning of a trend in U.S. veterinary medicine to back away from **overuse of antibiotics**, especially in pets with gastrointestinal (GI) issues such as diarrhea.[7]

According to the article, at an AVMA Convention held during 2022, Dr. Jennifer Granick, an associate professor of small animal internal medicine at the University of Minnesota College of Veterinary Medicine, suggested to her colleagues that treatment of diarrhea should focus not on killing (both bad and good) bacteria, but rather on restoring the health of the complex system of bacteria and other microbes (the microbiome) within the gastrointestinal tract.

> *"When I went to veterinary school, we were taught to use metronidazole [an antibiotic] for diarrhea, and what I hope to convince you of is that, maybe, we should be rethinking our approach," Granick said during her presentation, titled "First Do No Harm: A New Approach to Diarrhea in the Dog and Cat."*[8]

Granick shared that the last thing she now tries when treating most patients with diarrhea is antibiotics.

> *"That's not to say there aren't antibiotic-responsive diarrheas out there. There absolutely are," she said. "But antibiotics are the last thing I do, which is really different than when I first started practicing because it was the first thing I did."*

Antibiotics for Diarrhea Can Do More Harm Than Good

A healthy gut microbiome is essential to overall good health, and as Granick highlighted in her presentation, the microbes found in the GI tract of pets have several important jobs to do. Specifically, they "create defensive barriers against potential pathogenic organisms, aid in nutrient breakdown and energy release from ingested foods, provide nutritional metabolites for enterocytes, help regulate immunity, and metabolize substances the host can't, such as drugs."[9]

When it comes to the use of antibiotics to treat gut issues, as the U.K. study demonstrates, a growing body of research shows they have little or no positive impact in pets with acute diarrhea or hemorrhagic diarrhea syndrome (profuse bloody diarrhea). Evidence suggests, in fact, that antibiotics can compromise the microbiome, similar to infection, inflammatory disease, and poor diet. In other words, these drugs can do more harm than good as a treatment for many types of diarrhea.

Prebiotics as a Potential Alternative to Antibiotics

Granick suggested replacing antibiotics with prebiotics in the form of high-fiber pet diets and cilium additives, along with probiotics.

Before we get to that point, however, it's important to understand that when pets are fed a lifetime of whole, fresh, nutritionally optimal foods, in many cases their digestive tracts function normally through old age without the need for continuous supplementation with gut health products.

Adding a few gut health supplements to ultraprocessed diets is the equivalent of putting lipstick on a pig (no offense to pigs) or applying a coat of paint to cover cracks in the walls of a house sitting on a crumbling foundation. And in the case of prebiotic supplements, they can make a bad situation worse because they feed the growth of intestinal bacteria.

Prebiotics come in food or supplement form. Prebiotic supplements added to pet food lack the whole food matrix, so they are only complex sugars, including:

- Fructooligosaccharides (FOS), which is produced from the natural fermentation of sugar cane
- Inulin
- Oligofructose, a breakdown product of inulin

What many people don’t realize is that unlike food-based probiotics, prebiotic supplements aren't right for every pet. Marketing claims often position them as feeding only friendly bacteria in the digestive tract, but studies show this isn’t the case — prebiotics nourish unhealthy bacteria, including Klebsiella overgrowth and yeast as well.

For an animal with a very healthy digestive tract, prebiotic supplements probably won't do any harm. But many pets today have GI conditions like **inflammatory bowel disease** (IBD), leaky gut (dysbiosis), small intestinal bacterial overgrowth (SIBO), and other issues.

This means the good-to-bad bacteria ratio in the GI tract is out of balance, and we certainly don’t want to feed potentially pathogenic bacteria or yeast with large amounts of prebiotics. Pets with yeasty guts often have a significant worsening of their condition when fed prebiotic supplements. Interestingly, feeding dysbiotic pets prebiotic-rich whole foods usually does not.

In my opinion, however, if you feed a balanced, commercial raw or gently cooked diet or prepare balanced homemade meals that include a variety of low glycemic, high fiber veggies, some fermented foods, and rotate recipes frequently to diversify the microbiome, you don't need to add pre or probiotic supplements unless your integrative veterinarian specifically recommends them for some reason.

The Wrong Approach to Treating Large Bowel Diarrhea

Interestingly, another article I came across in the veterinary publication Clinician’s Brief reinforces Granick’s point with regard to jumping right to antibiotics to treat chronic diarrhea in otherwise healthy pets.

A 3.5-year-old male Irish Setter named Edward developed episodes of large bowel diarrhea that grew progressively worse. He was treated first with one trial of fenbendazole (an antiparasitic), followed by two trials of metronidazole (antibiotic), and a trial of tylosin (another antibiotic), but his condition remained “without resolution or consistent improvement.”[10]

Since it has been established in veterinary medicine that dogs with chronic idiopathic (no determined cause) large bowel diarrhea often respond to changes in dietary fiber, and since fiber can more broadly support gut health, next, Edward was given a fiber supplementation trial using unflavored psyllium husk added to his hydrolyzed diet. Thankfully, the dog did get relief from his diarrhea with the psyllium fiber.

There were several other things going on with Edward that I won’t get into here, but suffice to say, while I’m thankful the added fiber resolved his diarrhea, at least temporarily, my approach would have been significantly different given what he was being fed (an ultraprocessed kibble diet).

Once I determine an animal is otherwise healthy but for chronic or repeated episodes of diarrhea, I always begin at what is, to me, the most obvious starting point — the diet. I never recommend adding supplements to a poor-quality diet. Instead, I initiate a gradual transition to a higher quality, non-reactive diet as a first step. What happens after that depends on the pet’s response to those dietary changes.

Supplements (including fiber), and/or medications may or may not be necessary once an animal is consistently eating the diet he or she was designed to eat.

Sources and References

[1,5] Pegram, C. et al. PLOS One, October 4, 2023

[2] International Encyclopedia of the Social & Behavioral Sciences (Second Edition), 2015

[3,4] University of Minnesota, Center for Infectious Disease Research and Policy, October 4, 2023

[6] RVC VetCompass News Release, October 4, 2023

[7,8,9] AVMA News, September 12, 2022

[10] Clinician's Brief, November/December 2021