Beyond the Bite – A Deep Dive into the Connection Between Oral Hygiene and Companion Animal Health: Go! Solutions Dental + Immune Health™ Recipes

Petcurean Nutrition Team

Dental disease is among the most common diagnoses given by veterinarians in dogs and cats of all ages[1-4]. In fact, it has been suggested that by 3 years of age, more than 80% of dogs have active periodontal disease[5]. While many pet parents associate bad breath (halitosis) as the first sign of poor dental health, bad breath is usually indicative that plaque, tartar and gingivitis may already impacting a pet's oral health. Dental disease can lead to significant pain, inflammation, and infection, and ultimately tooth loss.

Periodontal disease is the term used to describe inflammation and infection of the tissues surrounding the tooth. Onset of the disease is initiated by excess bacteria in the mouth building up on the tooth surface, creating a layer of plaque[5]. Overtime, more layers of plaque build up causing it to thicken and mineralize, creating calculus (tartar). Once formed, calculus can only be removed by performing professional dental cleanings. Calculus can attract more plaque and bacteria, which eventually, when in contact with the gums, can result in inflammation and gingivitis, the first stage of periodontal disease[5]. As periodontal disease progresses, the tissues that support the tooth become inflamed, and bacteria from infected gums can enter the bloodstream, and can affect vital organs like the heart, kidneys and liver[6].

Immune health and dental care are two critical and surprisingly interconnected pillars of overall health for companion animals. Just as in humans, a robust immune system protects dogs and cats from a myriad of illnesses. A healthy immune system can support controlled bacterial growth in the mouth and limit plaque formation, as well as work to protect against infection of the gums and secondary organs. Simultaneously, good oral hygiene, including regular brushing, prevents painful oral inflammation and disease that can challenge the immune system and contribute to systemic disease. The dynamic relationship between the population of microorganisms in the mouth, the oral microbiome, and the immune system is in fact so intertwined, that the increased severity of periodontitis has been associated with increases in the likelihood of being diagnosed with cardiac, renal and hepatic disease, due to immune health function being compromised[7].

Maintaining good oral hygiene is crucial for preventing plaque and tartar build up and risks the development of periodontal disease. While regular brushing and professional dental cleanings are important for both dogs and cats, a functionally designed diet can also play a supportive role. Given the relationship between oral health and overall wellness, and to evaluate the efficacy of dietary management, we developed Go! Solutions Dental + Immune Health recipes, which are uniquely positioned and a first of its kind dual solution for pet parents searching for a diet to support their pet's dental care and immune system.

Study Design

To evaluate the efficacy the Go! Solutions Dental + Immune Health recipes in the reduction of three critical oral health parameters (plaque, gingivitis, and halitosis (bad breath)), a crossover study was conducted using 30 healthy cats and 30 healthy dogs.

Prior to the start of the study, all dogs and cats were scored on key oral health biomarkers and then underwent a standard dental procedure to have their teeth scaled and polished, ensuring clean teeth for the beginning of the study.

The dogs and cats were randomized into two even groups and fed either the dental kibble or a leading brand maintenance diet as a control kibble for 28 days. On day 28, each animal received a halitosis, gingivitis, and plaque evaluation. They then had their teeth cleaned a second time, ensuring clean mouths for the beginning of phase 2, where the animals were fed the opposing diet from the first phase, for another 28 consecutive days. In other words, if the animal were fed the dental kibble in phase 1, they would be fed the control diet in phase 2. At the end of the second phase (day 56), each cat and dog underwent a halitosis, gingivitis, and plaque evaluation.

Results

As compared to a leading maintenance brand, the Go! Solutions Dental + Immune Health recipe significantly reduced gingivitis and plaque build-up in dogs by 32.83% and 21.56% respectively (Figure 1). In cats, gingivitis and plaque build-up were significantly reduced by 43.47% and 58.14% respectively (Figure 1).

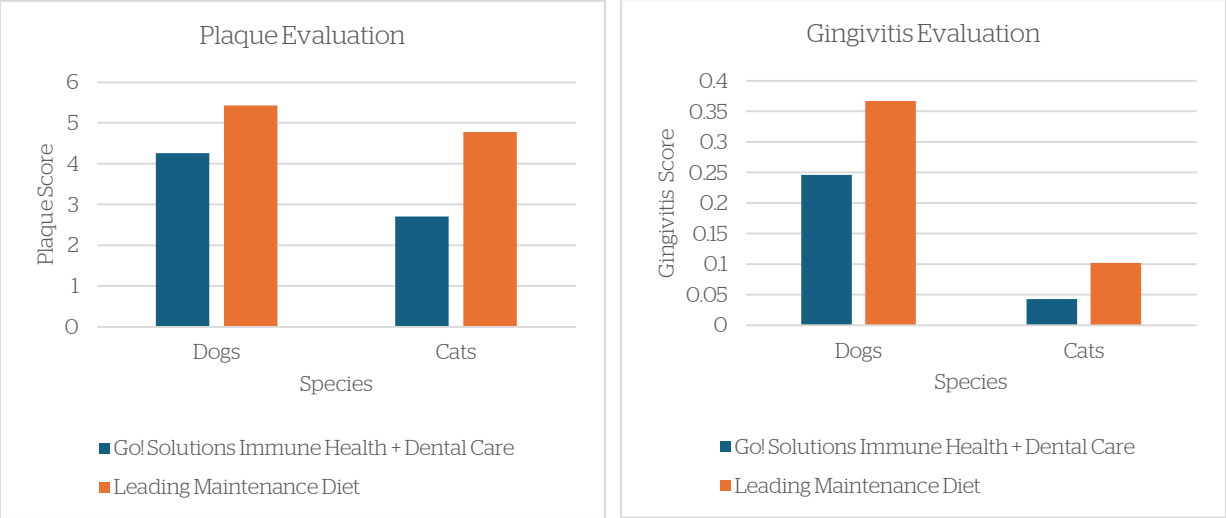

Figure 1: Average plaque and gingivitis scores for both dogs and cats following consecutive consumption of control and test diets for 28 days.

When halitosis (bad breath) was evaluated, the Go! Solutions Dental + Immune Health recipe was able to reduce halitosis by 45.62% in dogs and 19.55% in cats, as compared to the leading maintenance diet (Figure 2).

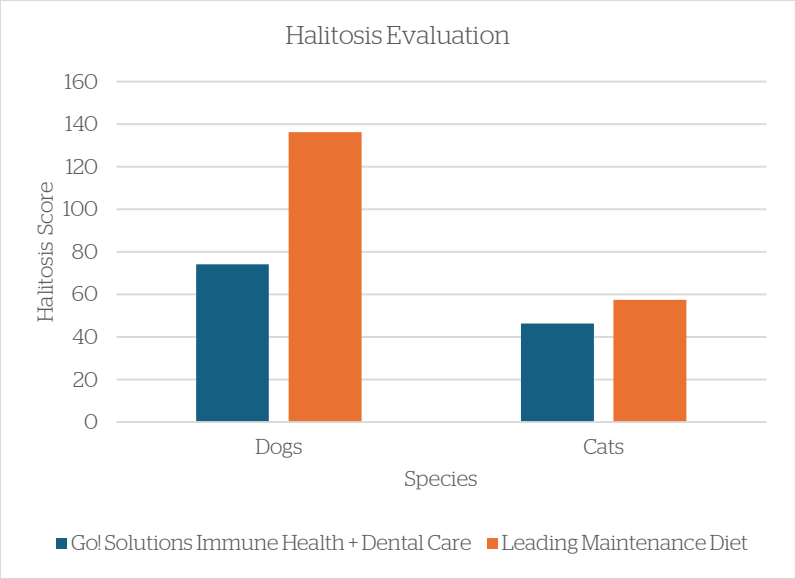

Figure 2: Average halitosis scores for both dogs and cats following consecutive consumption of control and test diets for 28 days.

Discussion

The Go! Solutions Dental + Immune health recipes have been developed to support the intricate relationship between a healthy immune system and dental care of companion animals through a multi-modal approach. The unique size, shape and density of the kibble are designed to enable the tooth to penetrate deeper before the kibble fractures, which provides a mechanical scrubbing action on the tooth surface while pets chew, similar to the effect of a toothbrush[8,9]. This physical abrasion effectively reduces the accumulation of plaque, as noted by the reduction of plaque seen in both dogs and cats when fed the dental kibble. Complimenting this mechanical action is the inclusion of sodium hexametaphosphate (SHMP), which effectively binds free calcium in the mouth, making it unavailable for calculus formation[8-10].

A robust immune system helps to maintain a healthy oral microbiome, minimizing inflammation and supporting gum health. Harmful and overgrown bacteria in the mouth can lead to gum inflammation, and bad breath and contribute to systemic disease as well[11]. The inclusion of Epicor™, a scientifically studied, yeast-based postbiotic in the Go! Solutions Dental + Immune health recipes works to support a healthy immune system, balance the gut microbiota, and reduce breath odor in dogs. 70–80% of the immune system resides in the gut, specifically in what is called the 'gut-associated lymphoid tissue' or GALT[12]. Postbiotics directly interact with the GALT, encouraging healthy immune responses and enhancing the body's natural defenses[13]. Supporting the GALT can lead to a systemic improvement in immune competence, indirectly supporting the body's ability to combat oral pathogens and control inflammation, thereby preventing the onset or progression of periodontal disease. Both cats and dogs saw a reduction in halitosis as compared to the control diet, indicating the beneficial effects this uniquely designed recipe to support a healthy immune response, and thereby a healthy oral microbiome.

The observed reduction in gingivitis is related to the approach of combining physical abrasion and immune system support. Gingivitis, primarily caused by bacterial plaque, is targeted by the kibble's

shape, texture, and density to physically scrub the tooth surface which effectively reduces plaque and calculus accumulation on the teeth. This lessens the bacterial irritation and subsequent inflammation of the gums[5]. Simultaneously, a robust immune system, supported by postbiotics, plays a crucial role in helping to control oral pathogens and mitigating inflammation. By supporting a balanced oral microbiome and nourishing the GALT, the diet enables the immune system to more effectively combat the bacteria that can trigger gum inflammation, ensuring the reduction in gingivitis is a cooperative result of both cleaner teeth, a healthy mouth, and a strengthened immune response.

The efficacy of the combined approach found in the Go! Solutions Dental and Immune Health recipes are supported by key study findings demonstrating reduction in plaque, gingivitis, and halitosis scores, as compared to the leading maintenance diet. These observed improvements reflect a reduction in the overall bacterial load and inflammatory response in the mouth, thereby lessening the bodily inflammatory burden and therefore, supporting a more robust and efficient immune system.

Conclusion

Overall, the Go! Solutions Dental + Immune Health recipe had notable positive effects on key oral health parameters. Compared to a leading maintenance diet, in both dogs and cats, the recipe was effective at reducing plaque, gingivitis and halitosis. These improvements not only offer daily support to pet parents looking for an option to support dental care of their pets, but also can support a healthy immune system, by reducing the challenges presented to the oral microbiome.

References

1. O'Neill, D. G., Church, D. D., McGreevy, P. D., Thomson, P. C., & Brodbelt, D. C. 2014. Prevalence of disorders recorded in dogs attending primary-care veterinary practices in England. PLoS ONE. 9 (3).
2. O'Neill, D. G., Church, D. D., McGreevy, P. D., Thomson, P. C., & Brodbelt, D. C. 2014. Prevalence of disorders recorded in cats attending primary-care veterinary practices in England. The Veterinary Journal. 202 (2).
3. Lund, E. M., Armstrong, J. P., Kirk, C. A., Kolar, L. M., & Klausner, J. S. 1999. Health status and population characteristics of dogs and cats examined at private veterinary practices in the United States. Journal of the American Veterinary Medical Association. 214 (9).
4. O'Neill, D. G., James, H., Brodbelt, D. C., Church, D. B., & Pegram, C. 2021. Prevalence of commonly diagnosed disorders in UK dogs under primary veterinary care: results and applications. BMC Veterinary Research. 17 (69).
5. Wallis, C. & Holcombe, L. J. A review of the frequency and impact of periodontal disease in dogs. 2020. Journal of Small Animal Practice. 61 (9).
6. Pavlica, A., Petelin, M., Juntes, P., Erzen, D., Crossley, D. A., & Skaleric, Uros. 2008. Periodontal disease burden and pathological changes in organs of dogs. Journal of Veterinary Dentistry. 25 (2).
7. Pereira dos Santos, J. D., Cunha, E., Nunes, T., Tavares, L., & Oliveira, M. 2019. Relation between periodontal disease and systemic diseases in dogs. Research in Veterinary Science. 125.
8. Clarke D, Servet E, Hendriks W, Thomas D, Weidgraaf K, Biourge V. 2010. Effect of Kibble Size, Shape, and Additives on Plaque in Cats. Journal of Veterinary Dentistry. 27(2):84-89.

9. Hennet P, Servet E, Soulard Y, Biourge V. 2007. Effect of Pellet Food Size and Polyphosphates in Preventing Calculus Accumulation in Dogs. Journal of Veterinary Dentistry. 24(4):236-239.
10. Stookey, G. K., Warrick J.M., & Miller, L. L. 1995. Effect of sodium hexametaphosphate on dental calculus formation in dogs. American Journal of Veterinary Research. 56(7):913-918.
11. Rawlinson, J. E., Goldstein, R. E., Reiter, A.M., Attwater, D.Z., & Harvey, C.E. 2011. Association of periodontal disease with systemic health indices in dogs and the systemic response to treatment of periodontal disease.
12. Vighi, G., Marcucci, F., Sensi, L., Di Cara, G., & Frati, F. 2008. Allergy and the gastrointestinal system. Clinical and experimental immunology. 153(1): 3–6.
13. Pinheiro, I., Robinson, L., Verhelst, A., Marzorati, M., Winkens, B., den Abbeele, P. V., & Possemiers, S. 2017. A yeast fermentate improves gastrointestinal discomfort and constipation by modulation of the gut microbiome: results from a randomized double-blind placebo-controlled pilot trial. BMC complementary and alternative medicine. 17(1), 441.