

# The benefit of low fat diets in dogs with gastrointestinal disease



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One indication for low fat diets in dogs with gastrointestinal (GI) disease is the management of dogs with hypertriglyceridaemia with GI disease presumed to be due to or related to hypertriglyceridaemia. The second indication is a group of dogs that have a normal serum triglyceride concentration, but have GI disorders resulting in difficulty to digest and/or absorb normal amounts of fat in the diet or dogs with lymphatic abnormalities.

## Dogs with hypertriglyceridaemia

Hypertriglyceridaemia is very common in dogs.<sup>1</sup> Definitive differentiation between primary or secondary hypertriglyceridaemia is sometimes difficult, but is based on exclusion of known or suspected risk factors of secondary hypertriglyceridaemia, such as diabetes mellitus, obesity or pancreatitis.<sup>2</sup> Also, primary hypertriglyceridaemia is often associated with a higher breed-related frequency, as described in Miniature Schnauzers in the US.<sup>3</sup>

The clinical relevance of hypertriglyceridaemia in dogs is due to its complications. By far the most important consequence of hypertriglyceridaemia in dogs is **pancreatitis**. In a recent study the risk of pancreatitis was shown to be about 5-fold higher in Miniature Schnauzers with severe hypertriglyceridaemia (above 10.17 mmol/l or 900 mg/dl) than in control dogs.<sup>4</sup> There is still some debate as to whether hypertriglyceridaemia causes pancreatitis, pancreatitis causes hypertriglyceridaemia, or both are caused by the same pathogenetic mechanism without one of them causing the other. However, in a recent study, Miniature Schnauzers with a previous history of pancreatitis had significantly higher serum triglyceride concentrations than Miniature Schnauzers without such history.<sup>5</sup> Pancreatitis is of great clinical significance because an acute episode can be associated with systemic complications and death, and chronic disease leads to destruction of exocrine and endocrine pancreatic tissue that can lead to exocrine pancreatic insufficiency and/or diabetes mellitus.<sup>6</sup>

Generally, treatment of hypertriglyceridaemia is recommended when serum triglyceride concentrations are above 5.65 mmol/l (500 mg/dl), though there is little scientific evidence for this cut-off value.<sup>2</sup> The primary therapeutic approach for treatment of hypertriglyceridaemia in dogs is feeding a **low fat food** (generally less than 20 g of fat/1000 kcal).<sup>2</sup> In a recent study Miniature Schnauzers with hypertriglyceridaemia were successfully managed by dietary change to a low fat food alone.<sup>7</sup> This study showed that while many dogs continued to have serum triglyceride concentrations above the upper limit of the reference range, none of them

had serum triglyceride concentrations that were above 500 mg/dl after the dietary change.<sup>7</sup> Also, interestingly, the lipoprotein profile of the dogs changed, more closely resembling the lipoprotein profile of healthy dogs. A more recent study showed similar results in dogs with mild to moderate hypertriglyceridaemia (Hill's unpublished data 2011). Serum triglyceride concentrations should be rechecked after withholding food for at least 12 hours approximately 3-4 weeks after changing the diet.

## Dogs without hypertriglyceridaemia

The digestion of dietary fat is more complex than the digestion of proteins or carbohydrates and it can easily be compromised. Therefore, dogs with a wide variety of GI problems can show maldigestion and/or malabsorption of fat. Decreasing the fat content in the diet may improve clinical signs in these patients. Essentially, any severe gastroenteritis, including IBD (Inflammatory Bowel Disease) with or without protein-losing enteropathy can lead to fat malabsorption. Even though patients do not have hypertriglyceridaemia, they cannot appropriately deal with the normal amount of fat in the diet and require the feeding of a low-fat diet and the avoidance of fat-containing treats.

There are many diets on the market that have a moderately decreased fat content, but only few that have a severely decreased fat content. Also, since these conditions can be complex, these patients may also benefit from prebiotics, probiotics, antibiotics, or anti-inflammatory or immunosuppressive agents.

## Conclusion

In summary, low fat diets can play a crucial role in the management of dogs with hypertriglyceridaemia and secondary GI disease or in dogs without hypertriglyceridaemia, but primary GI disease.

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## References

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# Hill's Evidence Based Clinical Nutrition

## Key Points

- Hill's™ Prescription Diet™ i/d™ Low Fat Gastrointestinal Health was effective in the management of dogs with hyperlipidaemia reducing both preprandial and postprandial serum triglyceride values.
- Healthy dogs fed a food with a prebiotic blend of beet pulp and flax seed increased significantly the number of beneficial bacteria in the faeces:
  - Significant increase in bifidobacter compared to baseline (9.1 vs 8.3 CFU log 10/g faeces; P=0.03)
  - Significant increase in lactobacillus compared to baseline (11.1 vs 10.3 CFU log 10/g faeces; P=0.04)

## Efficacy of a low fat diet in the management of dogs with hyperlipidaemia

**Purpose:** To demonstrate that Hill's Prescription Diet i/d Low Fat Gastrointestinal Health is appropriate to manage hyperlipidaemia in dogs.

**Design:** 9 Beagle dogs (2 female, 7 male, average age: 9 years), with serum triglyceride values >150 mg/dL (fasted samples) were enrolled in the study and fed i/d Low Fat for 29 days. Blood samples were collected after 20 hours of fasting, on day 1 and day 29 and analyzed for serum chemistry. Within 2-4 hours after feeding the dogs, an additional blood sample was drawn to analyze postprandial serum levels. Each dog served as its own control. Baseline food was a grocery brand food. Reference range for triglyceride concentrations (pre & post prandial) was 50-100 mg/dL.

**Results:** i/d Low Fat significantly reduced both preprandial and postprandial serum triglyceride values (p<0.01).

## The effects of commercially available probiotics and a prebiotic blend on the gastrointestinal microflora of healthy dogs

**Purpose:** To determine if a prebiotic blend (beet pulp, flax seed) increases concentration of beneficial bacteria in the faeces of healthy dogs that is seen when probiotics FortiFlora® & Prostora™ Max are fed.

**Design:** 20 adult Beagle dogs (10 females, 10 males, average age: 4 years) were fed a control food (Science Diet Adult) for 4 weeks. At the beginning of this period, faeces were collected for 4 days and a baseline composite sample was frozen for bacterial PCR analysis. During the "treatment" phase, each dog was fed a "treatment" for 2 weeks in a latin square/crossover design. The "treatments" consisted of control food, control+FortiFlora®, control+Prostora™, and control+prebiotic blend with a soluble fibre content of no less than 2% of the diet. Faeces were collected during the last 4 days of each "treatment"; a composite sample was frozen for bacterial PCR. Faeces were analyzed using bacterial PCR by the University of Illinois Animal Science Laboratory.

**Results:** The Prebiotic food group had a significant increase in bifidobacter compared to baseline (9.1 vs 8.3 CFU log 10/ g faeces; P=0.03)

- The control+FortiFlora® group had a significant increase in bifidobacter compared to baseline (9.3 vs. 8.3 CFU log 10/ g faeces; P=0.007)
- The control+Prostora™ group has a significant increase in bifidobacter compared to baseline (9.6 vs 8.3 CFU log 10/ g faeces; P=0.0002)

The Prebiotic group had a significant increase in lactobacillus compared to baseline (11.1 vs 10.3 CFU log 10/ g faeces; P=0.04)

- The control +FortiFlora® group had a significant increase in lactobacillus spp compared to baseline (11.3 vs 10.3 CFU log 10/ g faeces; P=0.01)
- The control+Prostora™ group had a significant increase in lactobacillus spp compared to baseline (11.5 vs 10.3 CFU log 10/ g faeces; P=0.003)

The prebiotic blend tested reached the beneficial bacteria fecal concentrations that are seen with commonly prescribed probiotic supplements.

