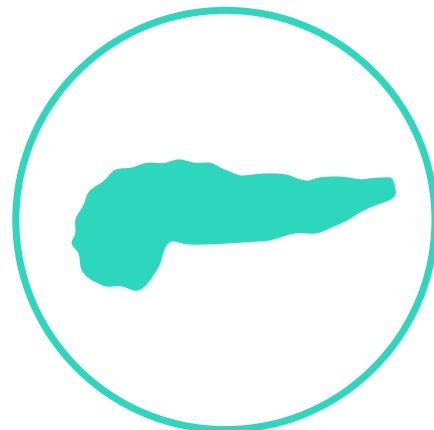


**Pancreatic Disorders**

HYPERLIPIDEMIA IN DOGS

Canine hyperlipidemia has emerged as an important clinical condition associated with a broad range of health conditions. Hyperlipidemia is an increased concentration of triglycerides (hypertriglyceridemia), cholesterol (hypercholesterolemia), or both in the blood. It can be physiological (e.g., postprandial) or pathological (i.e., persistent fasting hyperlipidemia), which can be further classified into primary or secondary hyperlipidemia.



Secondary hyperlipidemia is the most common pathologic form in dogs,^{1,2} and often results from an endocrine condition, such as hypothyroidism, diabetes mellitus, or hyperadrenocorticism.² Dogs with secondary hyperlipidemia typically exhibit clinical signs associated with the primary disorder. Other causes of secondary hyperlipidemia in dogs have been reported or suspected, including obesity, pancreatitis, very high-fat (> 50%) diets, cholestatic liver disease, protein-losing nephropathy, drug administration (i.e., glucocorticoids or phenobarbital), and others.²⁻⁴

Primary hyperlipidemia in dogs is more common in certain breeds, including miniature schnauzers, Shetland sheepdogs, and beagles, but it can occur in any dog. Dogs with primary hyperlipidemia may be asymptomatic for long periods, depending on the type and severity of hyperlipidemia. In some cases, however, secondary diseases can develop. Potential consequences of persistent hyperlipidemia may include pancreatitis, atherosclerosis (if plasma cholesterol > 750 mg/dl [19.4 mmol/L]), ocular disorders, and seizures.^{2,3}

Dietary modification plays a key role in the successful management of dogs with hyperlipidemia. The goal of nutritional intervention is to reduce blood lipid levels to lower the risk of complications while providing a nutritionally complete and balanced diet that meets a dog's nutrient requirements.

Key Messages

- The first step in managing a dog with hyperlipidemia is determining whether the abnormal lipid levels are the result of a recent meal or a primary or secondary disorder.^{1,5} Postprandial hyperlipidemia is transient and usually resolves 7 to 12 hours after a meal, depending on the fat content of the diet.^{1,3} Laboratory testing of blood lipid concentrations are ideally performed after the dog has been fasted for 12 hours.
- Secondary hyperlipidemia typically resolves after successful treatment of the underlying disorder (e.g., diabetes mellitus, hypothyroidism, or hyperadrenocorticism).¹ However, concurrent diet modification may be an effective adjunct therapy, especially for hypertriglyceridemia. A nutritionally balanced low-fat diet is recommended.^{1,3,6}

DID YOU KNOW?

Lipemia — grossly visible, cloudy or milky-appearing serum or plasma — results from moderate and severe hypertriglyceridemia, but not hypercholesterolemia or mild hypertriglyceridemia.²

Key Messages (continued)

- A low-fat diet (< 4 g/100 kcal ME) may be the only therapy needed to reduce serum triglyceride concentrations for some dogs with primary hyperlipidemia. For dogs that do not respond to a low-fat diet, an ultra-low-fat diet may be tried (1–1.2 g/100 kcal ME) or medical treatment may be started. These dogs will likely need a low- or ultra-low-fat diet for life to help normalize blood lipids.
- The recommended treatment goal is to keep fasting serum triglyceride concentration below 500 mg/dl (< 5.5 mmol/L).^{1,2} Although hypercholesterolemia management may be less clinically important than hypertriglyceridemia, treatment of severe hypercholesterolemia—at least with dietary management—should be considered to decrease risk of secondary diseases.²
- Increased soluble dietary fiber may decrease serum cholesterol and/or triglyceride concentrations when added to a low-fat diet.^{7–11}
- Supplementation with omega-3 fatty acid-rich fish oil has been shown to reduce triglyceride and cholesterol concentrations in dogs with primary hyperlipidemia¹² and in healthy dogs.¹³ The findings suggest an omega-3 fatty acid supplement or fish oil could be tried as an adjunct to a low-fat diet.²
 - Dosages of omega-3 fatty acids used in studies varied. Decreased hyperlipidemia has been achieved with doses of approximately 730 mg of omega-3 fatty acids once daily,¹² 200 to 300 mg/kg BW every 24 hours,² or 120 x BW_{kg}^{0.75} daily.¹⁴
- Only low-fat treats should be offered; otherwise, treats and table scraps should be avoided altogether.

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