

# Hepatic Disease – Feline

David C. Twedt, DVM, DACVIM

## Definition

The two most common feline hepatic disorders include *lipidosis* and inflammatory (*cholangitis*) liver disease. Hepatic lipidosis occurs either as a primary idiopathic syndrome or secondary to other conditions causing inadequate nutritional intake or lipid metabolism.

## Key Diagnostic Tools and Measures

The dietary history should be taken and energy requirements for the patient calculated based on ideal body weight (BW). The body condition score (BCS, see Appendix I) and BW should be noted. Cats with lipidosis frequently were obese prior to sudden weight loss and the current BW or BCS may not reflect severity of the disease so percent BW loss occurring from illness should also be calculated.

## Pathophysiology

The high protein requirements in cats must be met to prevent breakdown and mobilization of muscle protein for energy. Specific nutritional deficiencies may include cobalamin, arginine, taurine, and possibly carnitine. Hypophosphatemia, hypokalemia, and hypomagnesemia can also occur in the anorexic cat.

## Signalment

Cholangitis occurs in middle-aged to older cats and some may have concurrent chronic pancreatitis or inflammatory bowel disease. Secondary lipidosis is found in older cats as a result of another disease. Idiopathic lipidosis occurs in middle-aged to older cats with obesity a major risk factor for this condition.

## Key Nutrient Modifications

An esophageal feeding tube should be placed to assure adequate caloric intake in an anorexic cat with hepatic lipidosis. The caloric needs are calculated based on ideal BW and the patient is fed a blenderized nutritionally balanced diet that meets the cat's caloric and protein requirements. In cats, approximately 50 to 55 kcal/kg BW is a good starting point for caloric needs. Dietary protein and fat restriction is generally not necessary in cats with hepatic lipidosis. When protein restriction is necessary (i.e., hepatic encephalopathy is suspected) the dietary protein content fed should be reduced to 25% to 30% on a dry matter basis. The feeding volume begins low and is increased over 3 to 4 days to reach calculated nutritional requirements. Electrolytes potassium, phosphorus, and magnesium are supplemented in the fluids. These electrolytes should be monitored closely in the first few days because a refeeding syndrome may occur with these electrolytes becoming dangerously low.

## Recommended Ranges of Key Nutrients

Nutrient	% DM	g/100 kcal	% DM	g/100 kcal
	Recommended dietary level		Minimum dietary requirement*	
Protein <sup>#</sup>	30–45	7–12	28	6.5

Modified intake of these nutrients may help address metabolic alterations induced by disease states. The recommended dietary composition is shown as percent of dietary dry matter (DM) and as g or mg per 100 kcal metabolizable energy. All other essential nutrients should meet normal requirements adjusted for life stage, lifestyle, and energy intake.

\*Nutrient requirement for adult animals as determined by the Association of American Feed Control Officials.

<sup>#</sup>Protein should only be restricted when necessary to manage hepatic encephalopathy. In these patients, protein may be restricted to 25 to 30% of the diet dry matter (6 to 8 g/100 Kcal)

## Therapeutic Feeding Principles

The nutritional recommendations for idiopathic hepatic lipidosis in cats are completely empirical and not well documented. Force-feeding a diet often results in inadequate caloric intake, undue stress, and food aversion and should be avoided. Numerous reports suggest feeding various diets (with a variety of protein and fat content recommendations) and numerous dietary supplements. Commercial feline diets or nutritional support diets formulated suitable for tube feeding are generally used. Some recommend L-carnitine supplementation for cats with hepatic lipidosis at 250 mg/cat/day, but additional studies are necessary to determine the benefit. Arginine levels in commercial diets should meet the minimum dietary allowance for adult maintenance (>1.0% of the diet DM per day) and consequently supplementation is not necessary. Some suggest arginine (1,000 mg/day), thiamine (100 mg/day), and taurine (500 mg/day) for 3 to 4 weeks. Cats with hepatic disease and especially those with lipidosis may develop a cobalamin deficiency; cobalamin should be given (250 µg) subcutaneously weekly until concentrations reach normal and the cat is eating on its own. B-complex vitamin supplementation is recommended as well. Other supplements to consider include S-adenosylmethionine (SAME) and silymarin (milk thistle products) for their antioxidant effects.

■ **Treats** – Supplemental treats generally are not appropriate for cats with liver disease or lipidosis.

■ **Tips for Increasing Palatability** – During the recovery period of tube feeding, a highly palatable diet should be offered prior to feeding through the tube. Only when adequate nutrition is taken voluntarily can the feeding tube be removed. Improving palatability by warming the food, offering the original diet, or using taste enhancers such as tuna juice should be tried.

■ **Diet Recommendations** – Diets include commercial therapeutic diets for feline gastrointestinal or liver disease or feline maintenance diets. When protein restriction is required, feeding a specialty renal diet with a protein content of 25% to 30% DM is suggested. When nasoesophageal tube feeding is necessary, a liquefied diet must be used. The amount fed is based on calculated caloric requirements.

## Client Education Points

- Inflammatory liver disease (cholangitis) in cats often tends to wax and wane with flare-ups associated with anorexia and vomiting.
- Hepatic lipidosis can occur secondary to many other diseases and the prognosis for recovery is in part dependent on the nature of the primary disease.
- Idiopathic hepatic lipidosis requires aggressive nutritional management and owner compliance for home feeding. The prognosis is good for most cases.

## Common Comorbidities

Cholangitis frequently is associated with chronic pancreatitis and/or inflammatory bowel disease. Although the therapy for these concurrent diseases is often similar to that of cholangitis, one should refer to the chapters on management of those specific disorders. Secondary hepatic lipidosis requires specific management of the primary disease with careful attention to nutritional management as described for the idiopathic form of hepatic lipidosis.

## Interacting Medical Management Strategies

Cats with liver disease due to cholangitis are often treated with antibiotics, corticosteroids, and ursodeoxycholic acid. Vomiting is a frequent complication and the use of antiemetics for nausea and vomiting may improve nutritional intake of the patient. Nutritional aspects are paramount in the management of idiopathic hepatic lipidosis. Concurrent use of appetite stimulants is not recommended because of potential side effects and the fact that they are rarely effective in assuring adequate nutritional intake.

## Monitoring

The patient's daily caloric intake in addition to BW and BCS should be recorded. Liver enzymes and electrolytes should be evaluated periodically to observe improvement or need for supplementation. Cobalamin concentrations should be determined monthly or until patient is eating on its own.

## Algorithm – Nutritional Management of Feline Hepatic Disease

