

Overweightness / Obesity – Feline

Rebecca Remillard, PhD, DVM, DACVN

Definition

Obesity is qualitatively defined as an excess of body fat sufficient to contribute to disease. *Overweight* cats (body condition score [BCS] of 6 or 7/9) carry 25% and 30% body fat, respectively. *Obese* cats (BCS 8/9) carry 35% fat, whereas morbidly obese cats (BCS 9/9) carry 40% or more fat (see Appendix I for more on body condition scoring).

Key Diagnostic Tools and Measures

Body weight, body weight history (Appendix II), and BCS estimate the degree of body fat excess. Body condition scoring is performed visually and through palpation. Routine blood and urine measures are performed to rule out causative and concurrent medical conditions.

Pathophysiology

In the absence of endocrine or metabolic disease, pet obesity is an iatrogenic disease due to daily maintenance energy (MER) intake exceeding daily energy expenditure. MER for most indoor neutered cats is approximated by $MER = 85 \times (BW \text{ kg})^{0.75}$ (see Appendix III). Daily food intake history for overweight or obese cats will show chronic caloric excess.

Signalment

The majority of overweight or obese cats are between 2 and 15 years old, with most between 5 and 10 years of age, neutered, and primarily housed indoors. Mixed breeds are more likely to be overweight or obese than purebred cats.

Key Nutrient Modifications

The necessary nutrient change is a caloric deficiency while not restricting other non-energy nutrients unless necessary to address comorbidities. A variety of commercial therapeutic foods have been used for the past 20 years in the treatment of feline obesity. Methods of weight management have traditionally included the use of low-fat, high-fiber foods to reduce caloric intake and body weight while maintaining satiety. There are large variations in fiber (soluble and crude) content among feline weight loss foods. Increased dietary protein appears to promote weight loss and reduce loss of lean body mass during weight loss in cats. Foods with added L-carnitine may aid fat loss depending on the level of protein in the diet. More recent concepts of weight loss in cats include using high-protein, low-carbohydrate foods.

Recommended Ranges of Key Nutrients

Nutrient	% DM		g/100 kcal	
	Recommended dietary level	Minimum dietary requirement*	% DM	g/100 kcal
Protein	40–60	10–18	26	6.5
Fat	8–20	2.5–5.0	9	2.3

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 be increased relative to energy content of the diet in order to meet normal requirements adjusted for calorie restriction.

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

Therapeutic Feeding Principles

Although it is ultimately calorie restriction that induces weight loss, it is important to avoid excessive restriction of essential nutrients. Therefore, a low-calorie product with increased nutrient/calorie ratios should be considered. It is also important to promote fat loss while minimizing loss of lean tissue, which is influenced by diet composition. Most of the available foods contain 40% to 50% protein calories and 25% to 40% fat calories.

Traditional methods of weight management have used low-fat, high-fiber foods to reduce caloric intake and body weight while attempting to maintain satiety. Several different nutrient profiles, however, have been successfully used for feline weight loss: 1) low-fat, low-fiber kibble food; 2) low-fat, high-fiber canned and kibble foods; 3) high-fat, low-carbohydrate, moderate-fiber canned and kibble foods; and 4) high-protein, low-fat, moderate-fiber kibble food. All diet strategies have shown significant decreases in weight and body fat with insignificant loss in lean body mass when fed to obese cats. There are 10 to 15 different feline weight loss products to choose from depending on diet palatability and product availability; however, restricting daily calories and food intake is essential to all weight loss programs.

Overweight cats should be transitioned onto a weight loss food over a 5- to 10-day period. A measured daily food allotment should be offered to the cat in multiple (three to six) meals per day if possible. Feeding meals separately from other house pets and people is key to a successful weight loss program. The cat is weighed monthly and compared with an estimated ideal body weight.

■ **Treats** – Most owners appreciate a treat allowance of 20 to 25 kcal per day. The treats should be limited to low-calorie options, such as raw vegetables and fruits, which initially the cat may refuse until weight loss begins. Kibble pieces of the same or different feline weight loss diet or feline dental food may be used as a treat between meals. Any and all low-calorie treats allowed must be counted as part of the daily calorie intake and the daily food amount must be reduced accordingly.

■ **Tips for Increasing Palatability** – There is rarely a problem with cats not eating the total allotment of weight loss food if calorie restriction is in place. If there is food refusal of a weight loss diet, consider changing the form of diet (kibble vs. canned) to the form the cat prefers. Cats do have preferences for the texture, consistency and ‘mouth feel’ of food. Also consider using a high-protein, low-calorie weight loss food as cats have specific taste receptors for animal protein.

■ **Diet Recommendations** – Weight loss begins when cats are fed 50% to 75% of ideal weight MER calories per day using one of the many therapeutic feline weight loss diets. The estimated rate of weight loss is approximately 1% per week or 0.5 to 1 lb per month. Continued weight loss may require feeding 200 or fewer kcal per day as the cat approaches ideal body weight. The food must be measured and a daily food diary is illustrative.

Client Education Points

- Cat owners have indicated that feeding the cat is an important positive factor in their relationship with the pet yet the majority did not perceive their cats as overweight. The owner must be able and willing to control caloric intake for a weight loss program to succeed. Use of an automatic feeder is one option. Numerous options are available; thus, another key to success is a flexible design with regular follow-up with the client.
- Obesity treatment programs that include dietary changes, measured food allotments (using a gram scale is ideal), and monthly body weight checks by a veterinary health care team are successful. Weight loss is a slow steady progress which may take 6 to 12 months to reach a goal weight.

- In cats, weight rebound occurs after rapid weight loss and when cats are allowed free access to energy-dense food after weight reduction. Most often the diet used during weight loss is recommended for long-term weight maintenance of the goal weight. The only difference is a greater daily amount of food is used for weight maintenance.

Common Comorbidities

Recent research has suggested a mechanism for the link between excess body weight and many diseases. Obesity is now seen as a chronic pro-inflammatory state producing oxidative stressors. It seems that adipose tissue, once considered to be physiologically inert, is an active producer of hormones, such as leptin and resistin, and numerous cytokines. Of major concern are the pro-inflammatory cytokines for adipose (adipokines) tumor necrosis factor- α (TNF- α) and interleukins 1 β and 6.

Common comorbidities in overweight and obese cats include diabetes (insulin resistance and glucose intolerance) directly associated with the degree of adiposity and circulating inflammatory mediators; osteoarthritis, FLUTD, cardiovascular disease and pancreatitis due to a chronic low-grade inflammation and oxidative state; orthopedic (cruciate tears) injuries due to excessive weight; hyperlipidemias and hepatic lipidosis due to derangements in lipid metabolism; and non-allergic dermatitis due to the inability to properly self-groom.

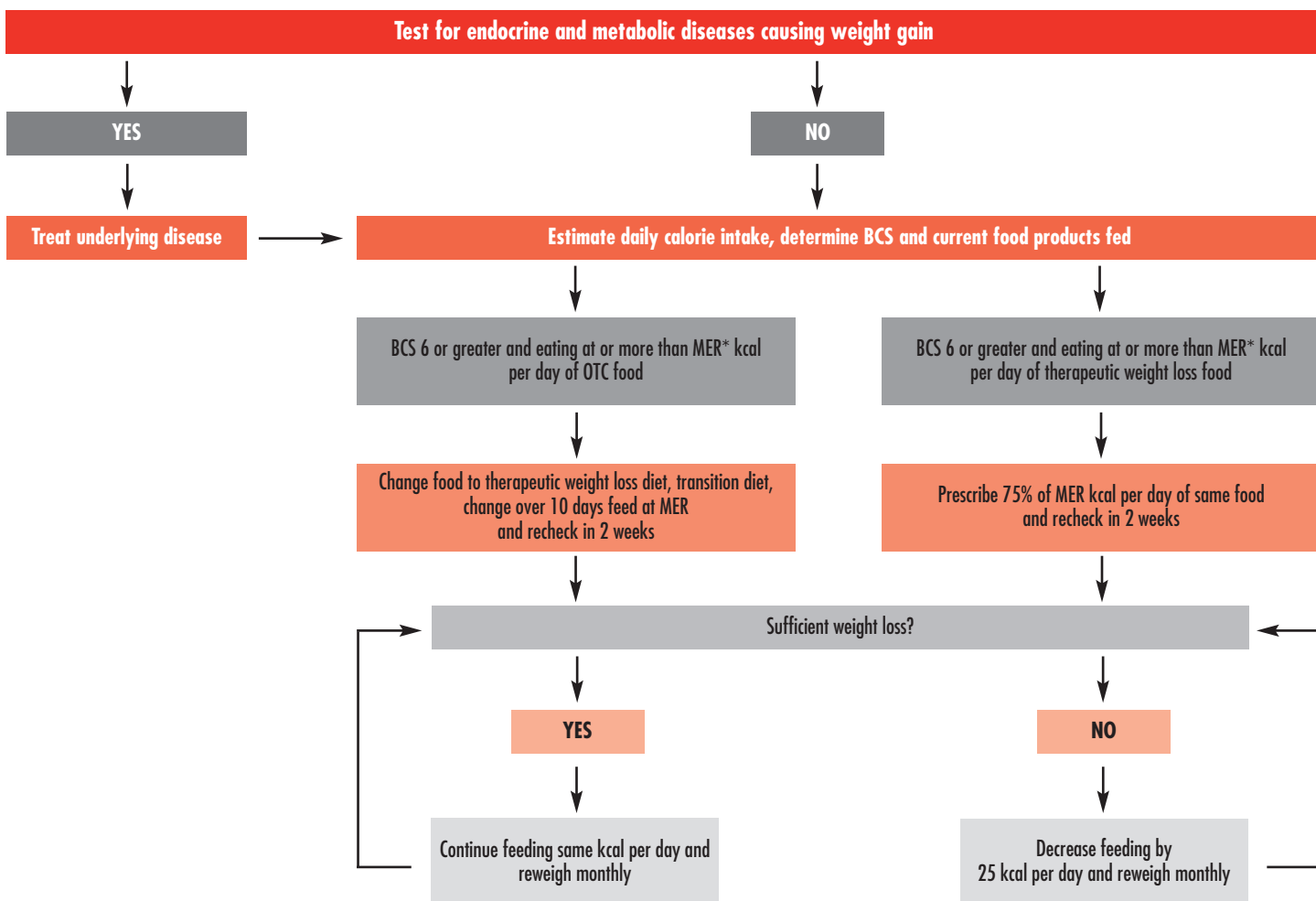
Interacting Medical Management Strategies

Feline hepatic lipidosis is rare in healthy cats fed fewer calories for weight loss as long as the cat consumes the entire daily allotment. If the cat refuses to eat the weight loss diet for several days, the possibility of hepatic lipidosis increases. Diabetic cats receiving insulin must be monitored carefully as insulin requirements decrease as insulin sensitivity returns. Cats receiving any medications based on body weight must be monitored carefully for dose adjustment as weight loss succeeds.

Monitoring

By recording body weight and BCS, ideal body weight can be more easily determined. Physical examinations and weight checks are suggested monthly with a discussion about daily feeding regime and food measurements. Behavioral changes in feeding the cat are essential. Discuss logistical feeding problems within the household (multi-cat household, boarding, family members, visitors, etc.). Changing food and adjusting calorie intake as needed to address problems and ensure continued weight loss. Clients should be encouraged to develop non-food related bonding activities to reduce the intake of calories and increase calorie expenditure.

Algorithm – Nutritional Management of Feline Overweightness/Obesity (BCS>5/9)



*MER = 85 × (BW kg)^{0.75}