Compendium

FOCUS ON NUTRITION

Canine and Feline Obesity: Frequently Asked Questions and Their Answers

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Abstract: *The diagnosis of obesity is simple and warrants intervention because of the association between obesity and increased morbidity. Pet owner commitment, a proper feeding plan, and regular monitoring are the keys to a successful weight loss program.[1] Treatment of obesity involves caloric restriction and/or diet change. Therapeutic weight loss diets differ in fiber, moisture, and digestible carbohydrate contents, and the diet choice should be tailored to the individual patient. Appropriate feeding management is equally important. To protect against the recurrence of obesity, owners should be educated on how to monitor body condition score and adjust the feeding program to maintain proper body condition.*

Is obesity a common problem in dogs and cats?

Obesity in the US pet population is common and rising. The prevalence of overweight/obesity in dogs increased from 25% in 1996 to 34% in 2006; in cats, it increased from 25% in 1994 to 35% in 2005.[2,3]

How is obesity diagnosed in clinical practice?

Obesity is diagnosed by comparing the patient's body fat stores with a validated body condition scoring system and assigning a body condition score (BCS) on a nine- or five-point scale (**TABLE 1** and **FIGURE 1**). BCS validation studies have found that each point above 5 on the nine-point scale and each 0.5 point above 3 on the five-point scale corresponds to 10% excess weight.[4] An overweight pet weighs 10% to 19% above its optimal weight, while an obese pet has a body weight ≥20% than ideal. Therefore, pets with ≥30% body fat and ≥20% excess body weight—corresponding to a BCS of ≥7 on a nine-point scale or ≥4 on a five-point scale—are obese.

Table 1. Common Body Condition Scoring Systems[4]

Nine-Point System	Five-Point System	Body Fat (%)	Body Weight Below or Above Ideal (%)	Interpretation	
				Dog	*Cat*
1	1	≤4%	–40%	Severely emaciated	
2	1.5	5%–9%	–30%	Emaciated	
3	2	10%–14%	–20%	Thin	
4	2.5	15%–19%	0% to –10%	Ideal	Underweight
5	3	20%–24%	0%	Ideal	
6	3.5	25%–29%	+10%	Overweight	
7	4	30%–34%	+20%	Obese	
8	4.5	35%–39%	+30%	Very obese	
9	5	≥40%	+40%	Morbidly obese	

Figure 1. Neutered male border collie (aged 4 years) before and after weight loss. The weight reduction plan included caloric intake reduction, diet change, and exercise. After the weight reduction was complete, feeding recommendations were given for maintenance of the new weight.

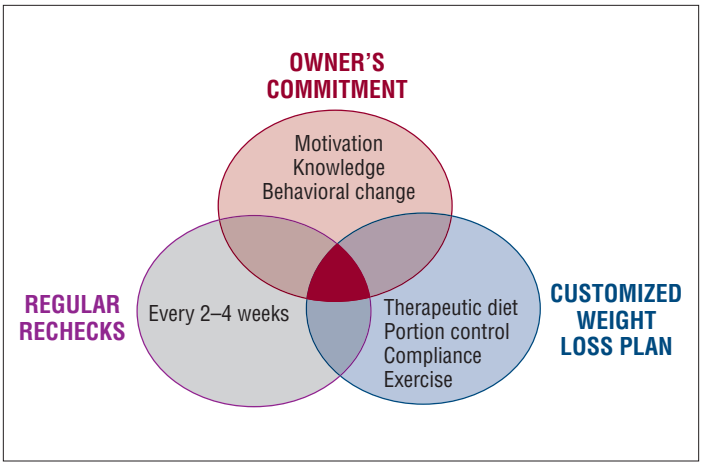

Figure 2. Components of a successful weight loss plan.

What are the major consequences of obesity?

Disorders of obese dogs include osteoarthritis, exacerbation of hip dysplasia, dyspnea, exercise and heat intolerance, anesthetic complications, dermatopathies, hyperlipidemia, pancreatitis, renal pathology, and reduced life span.[1,3] Disorders of obese cats include diabetes mellitus, dermatopathies, oral disease, urinary tract disease, lameness, and certain neoplasms.[1,2] Some of these disorders—in dogs and cats—can be eliminated with weight reduction.

What are the essential steps in assessing an obese patient?

Nutritional assessment[5] of an obese patient is part of the standard physical examination and includes:

- Sex, breed, age, activity, performance, and life stage of the patient
- Environmental factors
- Clinical history, including history of disease and medications that affect metabolism (i.e., steroids, levothyroxine sodium)
- Current clinical condition, including:
  - —Body weight and BCS
  - —Health status of organ systems that affect nutrient intake, assimilation, and excretion
  - —Results of laboratory tests (total T4, serum triglyceride, blood urea nitrogen, creatinine, and albumin levels; liver enzyme activity)
  - —Existence of any comorbidities of obesity
- Assessment of the food and feeding methods, especially in multipet households

An accurate diet history should be taken from the primary feeder and the daily caloric intake (including supplements and human foods as well as pet foods and treats) calculated.[6] The caloric contents of pet foods and treats are available from published product guides and manufacturers' Web sites and/or customer service departments. Web sites such as *Self* magazine's Nutrition Data (nutritiondata.self.com) or the US Department of Agriculture's National Nutrient Database (www.nal.usda.gov/fnic/foodcomp/search) can provide the caloric content of human foods.

What amount of caloric restriction is recommended for weight loss?

Caloric restriction is an important part of any weight reduction plan (**FIGURE 2**). Estimates of the caloric intake necessary to promote weight loss can be based on ideal body weight (IBW) or current caloric intake. Both methods require regular monitoring and adjustment.

Method 1: Calculation based on estimated ideal body weight

The patient's IBW can be estimated from the current body weight and BCS.[4] For example, if a patient's body weight is 50 kg and its BCS is 8/9 or 4.5/5, the patient's body weight is at least 30% above ideal (**TABLE 1**), or 130%. Therefore, the patient's IBW in kilograms is (100/130) × 50 = 38.5 kg.

The following equations can then be used to calculate caloric intake for weight loss:

- Dog: DER (kcal ME/d) = RER = 70 × IBW(kg)$^{0.75}$
- Cat: DER (kcal ME/d) = RER × 0.8 = [70 × IBW(kg)$^{0.75}$] × 0.8

In these equations, DER stands for *daily energy requirement for weight loss*, ME for *metabolizable energy*, and RER for *resting energy requirement*.

Alternatively, cats may be fed a set amount of calories per kilogram of IBW (**TABLE 2**).

Method 2: Calculation based on current caloric intake

In this method, the patient is fed 80% of its current total caloric intake as determined from the diet history. This may require switching the patient to a therapeutic weight loss diet to ensure adequate nutrient intake. This method requires an excellent diet history and is used when the calculated daily energy requirement for weight loss is lower than the patient's current caloric intake.[1]

In which patients should severe caloric restriction be avoided?

Rapid weight loss can worsen a catabolic state and should be avoided in patients with acute illness, cancer, diabetes mellitus, hepatic or renal disease, or cardiac dysfunction, as well as in healthy pregnant, lactating, and growing animals. Once the patient is stable and weight loss is indicated, the weight loss rate should be low to moderate to avoid compromising recovery from illness.

Table 2. Caloric Intake for Weight Loss in Cats[a,b]

Obese Body Condition Score	Calories/kg of Ideal Body Weight/d
6–7/9 or 3.5–4/5	30 kcal ME
8–9/9 or 4.5–5/9	35 kcal ME

ME = metabolizable energy

[a]Nguyen P, Dumon H, Martin L, et al. Weight loss does not influence energy expenditure or leucine metabolism in obese cats. *J Nutr* 2002;132(6 Suppl 2):1649S-1651S.

[b]Bissot T, Servet E, Vidal S, et al. Novel dietary strategies can improve the outcome of weight loss programmes in obese client-owned cats. *J Feline Med Surg* 2010;12(2):104-112.

Figure 3. Creep feeder constructed from a plastic storage box for feeding cats in a multipet household. An entrance was made by cutting the hole in the side wall of the storage box (*upper left*). The top lid of the box was removed for this photograph.

Is a therapeutic weight loss diet necessary?

Commercial therapeutic weight loss diets are formulated to provide an increased essential nutrient-to-calorie ratio, which ensures that the patient consumes adequate nutrients during caloric restriction. Feeding a small amount of a regular diet (e.g., "lite," "low fat," "adult maintenance") can be inappropriate and result in a lack of nutrients that drive energy metabolism and maintain muscle mass, the haircoat, and skeletal and overall health. Animals that need to lose only 5% to 10% body weight and do not require severe caloric restriction of RER to achieve their IBW may be able to efficiently lose weight on a calorie-restricted nontherapeutic diet.

Therapeutic weight loss diets have low energy density, which allows owners to feed a regular amount of food to reduce hunger, begging, barking, and food seeking. To achieve low energy density, these diets contain less fat or more fiber and/or water than nontherapeutic diets. A practical way to determine whether a diet change is indicated is to compare protein intake with the patient's protein requirement. A rule of thumb is to feed at least 2 g of crude protein/kg IBW/d to dogs and at least 3 g of crude protein/kg IBW/d to cats; although it is important to note that with increasing size of the animal, protein requirement per kilogram of BW decreases.[7] If the current food is deficient in high-quality protein, the diet should be changed to a therapeutic weight loss diet.

Are treats and snacks allowed during the weight reduction period?

Low-calorie commercial biscuits, low-calorie vegetables (e.g., green beans), and fatty acid supplements are allowed but must be counted in the caloric intake calculated for weight loss. The amount of calories from treats should not exceed 10% of the daily caloric intake because excess treats can unbalance the main diet. A number of healthy, low-calorie, nutritionally balanced treats are commercially available. If the owner insists on feeding human foods, preferred choices include low-calorie foods (e.g., unbuttered or lightly buttered popcorn) or vegetables.

What is the appropriate feeding schedule?

Pets on weight loss plans should be fed at least two meals per day at even intervals to encourage satiety, and the feeding plan should work for both the pet and the owner. Food must be measured at each meal using a measuring cup or a kitchen gram scale for precise caloric allocation.

How can obese pets be prevented from eating other pets' food?

Feeding cats in elevated locations or inside a "creep feeder" (**FIGURE 3**) can keep obese dogs from eating cat food. Multicat households are challenging, but a creep feeder can also be used to separate lean cats and kittens from obese cats for feeding. In this situation, the feeder opening must be large enough for a thin cat to enter and exit but too small to admit an obese cat. All leftover pet food should be removed from accessible locations.

What are the measurable indicators of a successful weight loss program?

The objective is to achieve a loss of 0.5% to 2% of the initial body weight each week of the weight loss period. At this rate, the desired total weight loss takes weeks to months. Factors that affect the weight loss rate include age, sex, neuter status, level of exercise, ambient temperature, stress, compliance with dietary protocol, and breed.

What is the recommended protocol for weight loss program monitoring?

Body weight and BCS should be checked every 2 weeks using the same calibrated scale until the weight loss trend is established, followed by monthly rechecks. Weekly changes in BW are very subtle in cats and small dogs (i.e., 30 to 120 g/wk in animals with an initial BW of 6 kg). If the weight loss rate is too slow, caloric allocation should be reduced by 10% until the next recheck. Weight loss that is too rapid can lead to adverse health effects such as weakness, lethargy, hyperlipidemia, fatty liver, muscle wasting, and increased risk of rebound weight gain.[8]

What should be done once the pet has achieved an ideal body condition?

Once an ideal BCS is achieved, patients should be carefully transitioned to a weight maintenance program. The caloric allocation used in the weight loss diet should be increased by 10% every 2 weeks. The patient's body weight should be closely monitored during this period. Once the caloric intake that maintains the new weight is determined, the patient can be transitioned to a nontherapeutic, low-calorie diet and treat options, fed in amounts that do not exceed the new intake. The patient's weight should be checked every 3 months to reinforce the weight control and prevent rebound weight gain.

Can feeding an uncontrolled amount of a low-calorie food maintain body weight?

Feeding a low-calorie diet free choice will likely result in weight gain in obesity-prone pets. In one study, dogs that completed a

weight loss program and were fed a low-calorie diet ad libitum gained weight during the first week of the maintenance period.[8]

Do carbohydrates from starch cause obesity in cats?

One of the proposed causes of feline obesity is consumption of high-carbohydrate diets. A review of current research does not support this theory and shows that the risk of obesity increases with increased dietary fat and with decreased dietary carbohydrate.[9] Furthermore, in one study, cats fed a low-carbohydrate (19% ME)/moderate-fat (30% ME) diet ad libitum gained three times more weight than cats consuming a high-carbohydrate (52% ME)/low-fat (24% ME) diet.[10] This could be due to the tendency of cats to overeat more energy-dense food when allowed to eat ad libitum.

Are high-protein, low-starch ("metabolic") diets preferable for weight loss in cats?

Studies providing evidence that high-protein, low-starch ("low carbohydrate") diets are superior to traditional weight loss diets for cats are lacking. In one study, weight loss in cats was induced by caloric restriction regardless of the diet type (low- versus high-carbohydrate diet).[11] This indicates that caloric restriction is more important than the diet composition. When feeding a "metabolic diet" for weight loss, owners should be advised that these diets have a higher energy density and have to be fed in very small amounts for caloric restriction, which may not be acceptable to the owner or the cat.

Key Points

Tips for building client commitment

- Educate client about the potential health risks of excess weight and the prolonged longevity in dogs and decreased morbidity associated with lower BCSs
- Discuss the cost (medical care, medication) of managing obesity-related diseases
- Advocate for improved quality of life, increased activity, aesthetics
- Share success stories
- Set up an incentive plan

Tips for improving client compliance

- Give the client a measuring cup and BCS chart
- Consider financial rewards for success (e.g., a one-time fee for a limited time period)
- Schedule rechecks
- Achieve measurable weight loss rates of 0.5% to 2% of body weight per week
- Take "before and after" photos
- Follow up with phone calls and e-mails
- Make the clinic scale available between rechecks

What can be done to minimize begging behavior and food seeking during weight loss?

Begging and food-seeking behavior often result in owner dissatisfaction and poor adherence to feeding recommendations. Satiety can be induced by feeding a diet high in fiber (**TABLE 3**), moisture (canned food), or a combination of both. Fiber and water lower the caloric density of food, promote gastric distention, and stimulate satiety.[12] High-fiber diets can have some side effects, such as flatulence, increased frequency and volume of defecation, increased fecal water loss, and constipation. It has been shown that the haircoat of dogs on a high-fiber diet is dull, which is possibly due to the decreased bioavailability of nutrients influenced by certain types of dietary fiber.[13]

Table 3. Commercially Available Therapeutic Weight Loss Diets

High-Fiber Diets (Canine, Feline)	Low-Fiber Diets (Canine, Feline)	Feline Metabolic Diets
• Purina Veterinary Diets OM • Hill's Prescription Diet r/d • Royal Canin Veterinary Diet Calorie Control CC High Fiber	• Royal Canin Veterinary Diet Calorie Control CC High Protein • IAMS Veterinary Formulas Weight Loss Restricted-Calorie	• Purina Veterinary Diets DM • Hill's Prescription Diet m/d • Royal Canin Veterinary Diet Calorie Control CC High Protein, can (pâté)

Are there any commercial diet alternatives to high-fiber weight loss diets?

High-fiber diets are inappropriate for patients with obstipation/megacolon, fecal incontinence, severe flatulence, joint pain, or limited opportunities to defecate. Several low-fiber, low-energy therapeutic weight loss diets (**TABLE 3**) can be recommended for fiber-intolerant patients.

References

1. Toll PW, Yamka RM, Schoenherr WD, et al. Obesity. In: Hand MS, Thatcher CD, Remillard RL, et al, eds. *Small Animal Clinical Nutrition*. 5th ed. Topeka, KS: Mark Morris Institute; 2010:501-542.
2. Lund EM, Armstrong PJ, Kirk CA, et al. Prevalence and risk factors for obesity in adult cats from private US veterinary practices. *Intern J Appl Res Vet Med* 2005;3:88-96.
3. Lund EM, Armstrong PJ, Kirk CA, et al. Prevalence and risk factors for obesity in adult dogs from private US veterinary practices. *Intern J Appl Res Vet Med* 2006;4:177-186.
4. Laflamme DP. Understanding and managing obesity in dogs and cats. *Vet Clin North Am Small Anim Pract* 2006;36:1283-1295, vii.
5. Baldwin K, Bartges J, Buffington T, et al. AAHA nutritional assessment guidelines for dogs and cats. *J Am Anim Hosp Assoc* 2010;46:285-296.
6. Michel KE. Using a diet history to improve adherence to dietary recommendations. *Compend Contin Educ Pract Vet* 2009;31:22-26.
7. National Research Council. *Nutrient Requirements of Dogs and Cats*. Washington, DC: The National Academies Press: 2006.
8. Laflamme DP, Kuhlman G. The effect of weight loss regimen on subsequent weight maintenance in dogs. *Nutr Res* 1995;15:1019-1028.
9. Backus RC, Cave NJ, Keisler DH. Gonadectomy and high dietary fat but not high dietary carbohydrate induce gains in body weight and fat of domestic cats. *Br J Nutr* 2007;98:641-650.
10. Coradini M, Rand JS, Morton JM, et al. The effect of diet composition on glucose, insulin and leptin concentrations, weight gain and food efficiency in healthy cats. *Proc Waltham Int Nutr Sci Symp*, 2010:52.
11. Michel KE, Bader A, Shofer FS, et al. Impact of time-limited feeding and dietary carbohydrate content on weight loss in group-housed cats. *J Feline Med Surg* 2005;7:349-355.
12. Wei A, Fascetti AJ, Villaverde C, et al. Effect of water content in a canned food on voluntary food intake and body weight in cats. *Am J Vet Res* 2011;72:918-923.
13. Nelson RW, Ihle SL, Lewis LD, et al. Effects of dietary fiber supplementation on glycemic control in dogs with alloxan-induced diabetes mellitus. *Am J Vet Res* 1991;52:2060-2066.

Quiz

1. **Which nutritional assessment is used to diagnose obesity in dogs and cats?**
   - **a.** basal metabolic rate
   - **b.** BCS
   - **c.** body mass index (BMI)
   - **d.** none of the above

2. **Between the mid-1990s and the mid-2000s, the prevalence of overweight and obesity in the US dog and cat populations increased by approximately**
   - **a.** 5%.
   - **b.** 10%.
   - **c.** 15%.
   - **d.** 20%.

3. **How much excess body weight above ideal is considered obese in dogs and cats?**
   - **a.** ≥5%
   - **b.** ≥10%
   - **c.** ≥15%
   - **d.** ≥20%

4. **What is a healthy weight loss goal in client-owned pets?**
   - **a.** 0.1% to 0.4% initial body weight/wk
   - **b.** 0.5% to 2% of initial body weight/wk
   - **c.** 2% to 3% of initial body weight/wk
   - **d.** 8% to 10% of initial body weight/mo

5. **Treats and people foods add extra calories to a pet's diet. The amount of calories from treats should not exceed ____ of daily caloric intake.**
   - **a.** 5%
   - **b.** 10%
   - **c.** 15%
   - **d.** 20%

6. **What is the best feeding schedule for weight loss in dogs and cats?**
   - **a.** free-choice feeding
   - **b.** no food one day a week
   - **c.** one daily meal of a measured amount of food
   - **d.** at least two meals per day at even intervals

7. **Feeding a canned food can aid in weight loss because the water content**
   - **a.** dilutes energy density of the food.
   - **b.** promotes satiety.
   - **c.** promotes gastric distention.
   - **d.** all of the above

8. **Compared with an average adult maintenance diet, a therapeutic weight loss diet**
   - **a.** allows for more severe caloric restriction without decreasing the amount of food fed.
   - **b.** lowers energy density through lower fat, higher water, or higher fiber content.
   - **c.** meets essential nutrient requirements when fed in an amount intended to restrict calories.
   - **d.** all of the above