Obesity may be defined as an excess of body fat sufficient to result in impairment of health or body function. In people, this is generally recognized as 20-25% above ideal body weight. In dogs and cats, the degree of obesity required to aggravate health problems has not been objectively defined, but is thought to be similar to that in man. Studies have confirmed an association between obesity and musculoskeletal problems, dermatitis and diabetes mellitus in dogs and cats.\(^{1,2}\) Obesity in young dogs is a risk factor for later development of mammary tumors.\(^{3}\) Severely obese pets may be at greater risk for anesthetic and surgical complications, heat or exercise intolerance, and complications from cardiovascular disease. In addition, obese cats face an increased risk of early mortality.\(^{4}\)

Approximately 25-30% of dogs and cats seen by veterinarians in the United States are overweight or obese.\(^{5}\) Despite widespread concern about obesity among pet owners, about 30-40% of owners of overweight dogs thought their own dog was at an appropriate body weight. Many veterinarians either do not recognize excess body weight, or choose not to address it. In a recent publication citing data from 46,710 dogs and cats, only 2% each of the dogs and cats were diagnosed with “obesity” yet body condition score data showed that at least 5% of both dogs and cats were obese and another 22-24% were noticeably overweight.\(^{5}\) As noted above, obesity is associated with significant health risks, and excess body weight may be considered a pre-clinical condition. Thus obesity management should be an important part of practice, and can be an excellent income generating program.

There are three major components to an effective obesity management program: 1) recognition of obesity and establishing client commitment; 2) flexibility in designing the weight loss program to account for both patient and client needs; and, 3) a defined plan for follow-up. Successful weight control requires excellent client compliance. Therefore, veterinarians must strive to understand their clients’ needs as well as the patient’s, so that the program can be designed accordingly.

**OBESITY ASSESSMENT AND CLIENT COMMITMENT:**

The first step in effective management of obesity is recognition of the problem. To help with this, a body condition score (BCS) system should be used. A BCS system is a semi-quantitative method of assessing body composition, based on visual assessment and palpation. It can provide a better indicator of the proportion of fat and lean than body weight alone.\(^{6,7}\) By recording both body weight and BCS, ideal body weight can be more easily determined. Animals that are becoming obese can be recognized sooner and managed more easily. Quantifying body condition also facilitates communications with clients, an important aspect of weight control.

The first step in enlisting the client is helping them recognize that their pet is overweight. Many owners of overweight pets do not realize their pet is obese. It may be helpful to demonstrate to the client how you assess obesity. Use of illustrations, such as an illustrated BCS system, can help. Discuss an abnormal BCS as you would any other abnormal laboratory value. Educate the client about the health risks associated with obesity, as you would for any other disease that you diagnose.

The client will be the key to successful weight loss. Behavior changes play a major role in successful weight management of humans. For successful weight loss in pets, behavior changes must occur in the pet owner. Specific recommended changes include measuring and monitoring food intake, monitoring body weight, and increasing the pet’s daily exercise. Have the client keep a log of food intake. Encourage the client to measure and record all food given to the pet. Everyone in the household who provides food or treats for the pet should participate.

**WEIGHT LOSS PROGRAM:**

Weight loss programs consist of numerous components: 1) the diet to be fed; 2) amount and frequency to feed; 3) the inclusion or exclusion of treats; and, 4) the type and amount of exercise.
Effective weight loss is dependent on creating a negative energy balance, forcing the pet to utilize fat stores for energy. Reducing food intake decreases energy intake, but different nutrients can have various effects on metabolism and satiety. Therefore, use of a nutrient modified diet may facilitate healthy weight loss compared to simple restriction of maintenance diets. Dietary characteristics that appear to facilitate the loss of body fat while minimizing the loss of lean body mass include reduced dietary fat and energy, increased dietary fiber and increased protein:calorie ratios.

**Fat and Calories** - Fat is the most calorie dense of nutrients, containing approximately 2.25 times more calories per gram than either carbohydrate or protein. Diets that are high in fat are generally higher in metabolizable energy. Research suggests that high fat diets contribute to the development of obesity, especially in cats.8,9

Weight loss can be achieved by simply feeding a high fat diet in very restricted quantities. However, there is compelling evidence that effective loss of body fat is facilitated by using low fat diets. When overweight dogs were fed either a high-fat, low-fiber diet or a low-fat, high-fiber diet at isocaloric intakes, the dogs fed the low-fat diet lost significantly more body fat despite similar total weight loss between groups.10 In addition to differences in composition of weight lost, serum cholesterol appears to be affected differently by high-fat or low-fat diets. Serum cholesterol increased in animals fed high-fat diets for weight loss but decreased in animals fed low fat diets.9-11 This may be of particular importance for obese patients with hypercholesterolemia.

**Fiber** - Dietary fiber refers to indigestible carbohydrates. Since it is indigestible, fiber contributes little usable energy to the diet. Many fiber sources also decrease total digestibility of energy and other nutrients in the diet. Thus, fiber can be used to dilute the metabolizable energy content of a diet. In addition, fiber has a number of physiologic effects that may be especially beneficial in the management of obesity.

Research with human volunteers had shown that dietary fiber can provide a satiety effect. That is, fiber can reduce or delay the return of feelings of hunger. This allows a reduction in calorie intake without the stress of prolonged hunger. Unfortunately, dogs and cats cannot verbalize their feelings of hunger so other means are used. A commonly used method for assessing hunger in rats and dogs is to monitor the consumption of a “challenge” meal provided some period of time following their regular meal. If the animal is satiated, it will consume less of the challenge meal than if it is hungry. Use of this methodology has demonstrated that dietary fiber does indeed provide a satiety effect in dogs and reduces their voluntary calorie consumption.12-13 Ad libitum feeding of a high fiber, low fat diet to overweight cats resulted in a voluntary reduction in calorie intake sufficient to induce slow, safe weight loss over several months.14

The energy needed to digest and absorb dietary nutrients amounts to approximately 20% of energy consumed.15 A substantial portion of this energy is used in support of the rapidly replicating cells of the gastrointestinal mucosa. Dietary fiber induces hypertrophy of the gastrointestinal tract and increases cell turnover, which utilizes additional energy. Thus not only can dietary fiber be used to dilute total dietary calories and enhance satiety, it may also increase metabolic energy expenditure.

**Protein** - Maintenance of lean body mass during weight loss represents an important component of successful weight loss. Maintaining lean body mass may help maintain energy expenditure and facilitate long-term weight maintenance. When obese humans were fed very low energy diets, increased dietary protein helped maintain lean body mass. Recent research showed that increased dietary protein has similar effects in cats and dogs.16,17 When obese cats were energy restricted to achieve a loss of 1% body weight per week using either a normal protein, low calorie diet or a low calorie diet with an increased protein:calorie ratio, total weight loss and rate of loss were very similar between diets, but composition of loss differed significantly.16 The higher protein diet limited the loss of lean body mass and resulted in approximately 10% greater fat loss. Dogs responded similarly. Dogs fed diets with 20% of calories from protein lost about twice as much lean body mass with less fat loss compared to dogs fed diets with 30 or 39% of calories from protein.17

**Amount and frequency** - Most standard weight loss protocols require estimating the pet's ideal body weight, calculating the maintenance energy requirements (MER) based on ideal weight, then
reducing that number by 25-50% to arrive at an estimate of the daily calorie allowance. Recent research has shown that, while these protocols produced an average rate of weight loss of 1 to 2% of bodyweight per week, the individual response was extremely variable. The difference in rates of weight loss were attributed to individual differences in actual MER. When a computer program was used to adjust calorie allowance based on the animal’s response to treatment, variation in rate of weight loss was reduced considerably. Rapid weight loss is associated with a greater risk of weight rebound in dogs, and may increase the risk for hepatic lipidosis in cats. Therefore, the rate of weight loss should not exceed 1% to 2% of body weight per week.

If possible, patients should be fed several times daily. Eating, especially a palatable food, increases the metabolic rate. Feeding the same number of calories in four meals instead of one will reduce the number of usable calories, aiding in weight loss. In addition, feeding several times daily may reduce “begging” by the pet.

*Treats* - Treats are an important part of the relationship between some owners and their pets. Discuss treats with the client prior to developing the patient’s weight loss protocol. Most clients that offer treats will continue to do so. If they choose to include treats, a specified quantity of low calorie foods or commercially prepared treats should be included in the pets’ total daily allowance. Since most treats do not provide balanced nutrition, treats should be limited to 10% of the daily calorie intake.

*Exercise* - Depending on the health of patient and client, varying degrees of exercise should be prescribed. Exercise can increase calorie expenditure and help maintain lean body mass which stimulates basal energy metabolism. It may also provide an interaction between pet and owner as a substitute for giving treats. Daily walks may be used to increase a dog’s (and client’s) exercise, while increased play time can be used for both dogs and cats to increase exercise. Some cats also respond to daily walks.

**FOLLOW UP COMMUNICATION:**

Frequent follow-up communication may facilitate a greater success rate. A telephone call to the client within 1-2 weeks after initiating a weight reduction program may help emphasize its importance, and will provide an opportunity to address any difficulties. Regular “weigh-ins” can provide a stimulus for client compliance and provide an opportunity to identify any problems. The pet’s weight should be recorded weekly in the home or clinic, and at least monthly at the clinic. Plan to adjust the feeding recommendation on a monthly basis, as the patient’s MER may change in response to calorie restriction.

Gradual weight loss in dogs, as in people, is more likely to allow long term maintenance of the reduced body weight. Weight rebound following weight loss can be minimized by providing controlled food intake, adjusting the calories fed to just meet the needs of the pet for weight maintenance. Clients already accustomed to measuring food and monitoring their pet’s weight should be encouraged to apply these behavior modifications to long term weight management.

**OBESITY PREVENTION:**

Obesity is one of the few diseases that usually can be prevented by dietary means. While there may be a number of contributing factors, obesity is caused by consumption of calories in excess of need. Appropriate control of calorie intake will reduce the likelihood of obesity.

Neutering reduces MER through a direct effect on resting metabolism. Clients should be advised of the need to change their pet’s feeding management prior to admission for neutering, or while discharging the patient following surgery. Teach clients how to evaluate their pet’s body condition. Recommend a food with a calorie density appropriate to the needs of the individual patient. Have them feed measured amounts of food, and adjust the amount to maintain their pet in ideal body condition. Feeding recommendations provided by manufacturers of commercial pet foods should be considered only as guidelines. Many animals need more or less than the recommended amounts.

Obese dogs and cats are those with a body condition score of 8 or 9, while overweight pets have a body condition score of 6 or 7. Overweight pets may benefit from weight loss, but it appears to be less critical. The owners of these pets should be counseled about health risks of obesity and steps to take to prevent its occurrence. For example, reducing or eliminating table scraps or other high fat foods, feeding
measured amounts rather than free-feeding, increasing activity or switching to a lower calorie pet food may be recommended. However, pets that have a BCS of 8 or 9 should be considered at risk of obesity-related problems, and should undergo weight loss.

References
22.
Behavioral Aspects of Canine Weight Management: 
Understanding the Dog-Owner Relationship

Introduction

Diet and owner commitment are equally significant aspects of canine weight management. Without one or the other, weight loss and maintenance of the new weight are unlikely.

In terms of diet, use of an appropriate product is important to facilitate loss of body fat rather than lean body mass. The maintenance of lean body mass during weight loss is important since basal energy expenditure is driven primarily by lean body mass. Maintaining lean body mass may increase the likelihood that dogs can maintain long-term weight loss. The nutritional composition of the product can affect this.

Isocaloric reduction of calories with a low fat, high fiber diet facilitated a greater loss of body fat than did a high fat, low fiber diet (Borne 1996). In addition, dietary fiber helps to decrease calorie intake by providing a satiety effect and by diluting calories (Jackson 1997). Increased dietary protein also facilitates loss of fat while sparing lean body mass (Hannah 1998). Dogs fed diets with 20% of calories from protein lost about twice as much lean body mass with less fat loss compared to dogs fed diets with 30% or 39% of calories from protein.

These research findings lead to nutritional enhancements in Purina® Fit & Trim® brand dog food. One objective of this project was to evaluate the efficacy of the new formula in overweight pet dogs.

Another critical aspect to weight loss is owner involvement. Behavior changes must occur in the pet owner if the pet is to lose weight, but often owners find it difficult to change feeding and exercise habits. Another objective of this study was to evaluate attitudes and behaviors that may influence owner involvement and compliance with canine weight loss programs.

Study Design

The study was coordinated by North Carolina State University College of Veterinary Medicine, and involved 11 primary care veterinary practices in North Carolina. The owners of 64 overweight, but otherwise healthy dogs were recruited to participate in the 8-week study, which was conducted during the fall of 1999. Prior to weight loss, all dogs received complete evaluations including physical examinations, serum thyroid profiles and biochemical analyses.
Calorie allowances for weight loss were based on a maintenance energy requirement (MER=132 x Kg $^{0.75}$) less the calorie deficit needed to allow weight loss at 2% initial body weight per week. Up to 10% of calories were allowed as specified commercial snacks. All dogs were fed a diet of Purina® Fit & Trim® dog food and a choice of several Purina dog snacks.

The owners were requested to keep a daily food diary, which was to be turned in at the end of the study. Dogs were to be returned to their veterinarian for weight and body condition score (BCS) assessment every 2 weeks. Owners and veterinarians also took photos of the dogs throughout the study.

Before and after the 8-week weight-loss program, owners were requested to complete a questionnaire regarding their relationship with their dog, feeding habits, reason for participation in the program and other pertinent issues. The post weight-loss questionnaire also solicited opinions regarding the weight-loss program itself.

Results

Eight dogs were eliminated from the study due to pre-existing medical conditions or incomplete data collections. Ninety-three percent of the dogs had a BCS of 7 (9 point scale) or greater at the start of the study. All dogs were neutered and 75% of the participating dogs were female. Most (84%) dogs were between 3 and 9 years of age. Dogs of all sizes were included, ranging in body weight from 12 to 147 pounds, but 61% were large breed dogs (>65 lbs. at start of test).

Of the 56 dogs completing the study, 96% lost weight. The average weight loss was 6.7% of initial weight, with the greatest weight loss taking place during the first four weeks. Weight loss was highly variable among dogs: 11% lost less than 2% (n=4) or gained weight (n=2), while 66% (n=37) lost at least 5% in 8 weeks.

Forty-eight owners completed both pre- and post-study surveys. Almost 80% of owners said their dogs were overweight for more than one year, even though their veterinarians saw all dogs annually. Veterinarians were cited as the number one way (93%) owners discovered their dogs were overweight, although 81% also said visual observation helped them discover their dogs were overweight. Eighty-three percent of owners fed snacks and 40% fed table scraps. Over 70% said they measured the amount of food fed. Almost 60% of owners of the overweight dogs consider themselves to be overweight.
Survey respondents said that, other than losing weight, the top three benefits from the weight loss study would be improved health for their dogs, happier dogs and more active dogs. Owners also cited three top reasons why they were interested in this particular weight loss program: weight loss/improved health for their dogs, veterinarian recommended program and veterinarian supervised program. They stayed in the program because of weight loss, the perceived health benefits to their dogs, the required bi-weekly veterinary visits, daily food and exercise diary and veterinarian supervision. Eighty-one percent of respondents said their veterinarian’s pet food recommendation was important.

Two-thirds of the participants rated the overall program as very well liked, with only one participant rating the program negatively. Top reasons cited for liking the program were that it was simple and easy to follow, their dogs lost weight and veterinarians were involved in monitoring the progress. Seventy-three percent indicated that it was not difficult to keep their dog on the weight loss program for 8 weeks.

Nearly all the owners (94%) said they would recommend this plan to owners of overweight dogs.

While long-term weight maintenance was not evaluated in this study, 96% of owners were confident that they would be able to maintain weight loss. They expected to do this by continuing to feed Fit & Trim (89%), maintaining or increasing their dog’s exercise (86%) and feeding fewer treats (50%).

**Discussion and Conclusions**

Based on the findings in this study, it is important for veterinarians to evaluate their patients for obesity and to inform clients when their dogs are overweight. Components of the weight loss program that were disliked by some of the participants included limitations on treats, feeding twice daily and maintaining a daily log of food intake. Other participants saw these same components as strengths. Thus, it is important for veterinarians to client preferences and to design the individual patient’s weight loss program around those preferences.

The majority of dogs were being fed reduced calorie dog foods prior to the start of this study, without weight loss. The findings from this study emphasize the need to provide specific feeding instructions for clients, in order to facilitate weight loss. While not evaluated in this study, the variation in response to the calculated calorie allowances were similar to those observed in other studies (Laflamme 1997) and emphasize the need to re-evaluate and adjust feeding guidelines throughout a weight loss program.
Overall the program was successful in promoting weight loss in dogs and participants were positive about their experience. It is clear that veterinarian involvement is very important to stimulating participation in canine weight loss programs and keeping dog owners compliant. In addition, a simple, structured program including an appropriately formulated dog food makes it easy for owners to change their behavior and makes them optimistic about maintaining their dogs’ new weight.

References

TIPS FOR GETTING THOSE POUNDS OFF

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1. **USE A BODY CONDITION SCORE SYSTEM FOR ALL PATIENTS**
   A body condition score is a semi-quantitative assessment of the proportion of fat and lean. This provides an advantage over body weight alone since body weight does not necessarily reflect body fatness and ideal body weight often is unknown. Body condition score systems provide a rapid, easy way of identifying animals that are overweight and estimating the degree of obesity. They provide a client communication tool. Use of illustrated systems may help clients see how their pet should look, while a “hands on” demonstration can help them understand how you made your diagnosis.

2. **DIAGNOSE OBESITY**
   Too often, obese dogs and cats are not diagnosed as obese. For reasons not yet known, many practitioners seem unwilling or unable to diagnose obesity. In a recent publication citing data from 46,710 dogs and cats, only 2% each of the dogs and cats were diagnosed with “obesity” yet body condition score data showed that at least 5% of both dogs and cats were obese and another 22-24% were noticeably overweight (Lund et al. JAVMA 1999). Use a body condition score system to diagnose obesity, and treat the abnormal value as you would other abnormal laboratory values in your discussions with the client.

3. **UTILIZE EFFECTIVE, TWO-WAY COMMUNICATION**
   As noted in the following tips, communication is critical. It is important that the client be made to recognize not only that their pet is overweight, but also the potential implications and health concerns associated with obesity. To effect obesity, the client must accept responsibility for implementation of a program. However, two-way communication is critical. You and your staff must be aware of the clients’ needs so that the program is designed to facilitate compliance.

4. **USE SUPPORT STAFF FOR WEIGHT MANAGEMENT PROGRAMS**
   Once the diagnosis of obesity has been made and other concurrent illnesses are under control, turn over the details of the obesity management program to support staff. Technicians and receptionists routinely interact with clients 2 to 3 times more than veterinarians do. Take advantage of this by allowing them to coordinate and manage an obesity management program for your clinic. Whether separate appointments are scheduled for enrollment or group clinics are held, allow your technicians to work through the details of collecting a thorough diet history, building an understanding of client preferences and capabilities, and designing the individualized program designed for that patient/client combination.

5. **BE FLEXIBLE AND DESIGN INDIVIDUALIZED WEIGHT LOSS PROGRAMS**
   To be effective, a weight loss program must be implemented. The likelihood of client compliance increases when the program suits the clients’ needs as well as the needs of the patient. Therefore, it is important that information on client preferences be obtained and considered when designing the program. Also, it is important to recognize that individual animals have different needs. Maintenance energy requirements can vary widely between individuals. A standard equation for calculating energy needs may over- or under-estimate MER, leading to a feeding recommendation that may not produce weight loss or may produce too rapid weight loss.
6. **RECOGNIZE THE IMPACT OF THE HUMAN-ANIMAL BOND**

Food and treats are often rewards or a means of bonding between client and pet. Deprivation of either can create a non-compliance situation. Therefore, it is important to understand the relationships involved, and the willingness to substitute “rewards”. Treats should always be discussed before designing the weight loss program, and incorporated into the program for most pets. Treats can be managed as a percentage of the daily calorie allowance (e.g. 10%), subtracted from the total before calculating how much food is allowed per day. If this method is followed, it is helpful to also provide a list of recommended treats with the calories and portion size. An alternative is to encourage clients to set aside a portion of the daily food allowance. Kibbles or meatballs can be given with all the pomp normally afforded other treats. An even better option is to substitute treats with hugs, playtime or walks, if the client is willing and able. This provides an alternate exchange for the client and pet that can have long-term weight and health benefits—perhaps for both.

7. **FOLLOW UP WITH CLIENTS**

If the client is sent out the door with a prescription for a weight loss program for their pet and admonished to return in 6 to 12 months with a slimmer pet, the odds of success are small. More frequent communications initiated from the veterinary practice provide several benefits that increase the odds. First, it reinforces the importance of weight management in the mind of the client. Second, it provides an opportunity for the client to ask minor or significant questions that they may not have sought answers to—at least from your clinic. Third, it allows opportunities for adjusting the feeding guidelines to achieve a safe, effective rate of loss followed by adjustments for long-term weight maintenance. Finally, it enhances client loyalty by demonstrating that you and your staff really care about your clients. A telephone call from your office within the first 2 weeks begins this process and allows the client to discuss any minor issues that have come up. A monthly in-clinic re-check allows the weight to be checked and adjustments made to the program. These also may serve as motivation for continued client compliance, as is true for human weight management programs.

8. **REWARD SUCCESS**

Clients must work hard to help their pets reach a healthy weight. Rewards for successful weight loss can be great practice builders. They again show that you and your staff care about the client and pet, and encourage return visits. Rewards may be as simple as a congratulatory card signed by those who helped supervise the program. Or they may include coupons for discounts on future services or products purchased from your clinic. Be creative!!

9. **USE PHOTOGRAPHS**

Gradual weight loss is safe weight loss, so it takes many months for most pets to transition from obese to sleek. By the time they reach their trim and fit appearance, the client may not remember how they looked with those extra pounds. Taking a “before” and “after” photograph will allow the client to really see how their dog or cat has trimmed down. Displaying the photo pairs on an “honor board” in the practice waiting room can provide further benefits. It can provide another “pat on the back” for the client that has succeeded in helping her pet slim down, potentially strengthening that client’s loyalty to your practice. In addition, other clients seeing the photos may be stimulated to recognize obesity in their own pet or to inquire about weight management programs.