Home-Prepared Dog and Cat Diets Second Edition

SECTION I Nutrition and Dietary Management

CHAPTER 1 *Homemade Diets*

In the United States, there are more than 140 million dogs and cats. The vast majority of pets receive more than 90% of their calories from commercially prepared pet food. There is an increasing interest in feeding home-prepared foods to pets for a variety of reasons. In a recent telephone survey, owners of 635 dogs and 469 cats were questioned regarding diets fed to their pets. More dogs received noncommercial foods (table scraps, leftovers, or homemade foods) as compared to cats. Noncommercial foods were a part of the diet in 31% of dogs and 13% of cats and comprised at least one-fourth of the diet for 17% of dogs and 6% of cats. About 3% of pets were exclusively fed homemade diets, and 7% of dogs received homemade food for at least half of their diet. Treats of some kind were given daily to 57% of dogs and 26% of cats. Supplements were given to 13% of dogs and 6% of cats and were reported to include multivitamins, fatty acids, chondroprotective agents, vitamin C, yeast, taurine, zinc, calcium, and antioxidants, among others.

For humans, food consumption has social and cultural connotations. With the humanization of pets, owners may associate social and cultural behaviors with their pets. In the telephone survey, owners said that cuddling or petting their animals and talking to the pets were the most common activities shared with their dogs or cats. Dog owners were more likely to walk or run with their pets, play with toys together, play fetch, ride in the car together, participate in obedience or agility training, and go to work together as compared to cat owners. Other activities that both dog and cat owners shared with their pets included watching their pets play, grooming their pets, watching television with their pets, and eating with their pets. As pets are treated more as "humans," many owners may feel that their pets should share the food customs of humans.

There are many reasons suggested as to why a homemade pet diet is desired. Some owners wish to feed natural or organic foods or vegan or vegetarian foods. Many wish to cook for their pets and provide a varied diet. Others may find commercial pet food labels and ingredients confusing and want to avoid additives, preservatives, chemicals, or certain ingredients found in pet foods. In the previously mentioned telephone survey, owners feeding noncommercial pet foods had less trust in their veterinarian to provide sound nutritional advice and felt that dogs and cats needed a variety of different foods in their diet. Owners feeding noncommercial pet foods were more likely to feel that processed foods for pets were unhealthy, that cooking destroys nutrients in pet foods, and that organic foods were safer and healthier than other foods. Owners that fed noncommercial food were more likely to feel that dogs and cats need more meat than is provided in commercial products, that information on pet food labels is misleading, and that additives in pet foods have unhealthy side effects. They were less likely to trust pet food manufacturers to provide nutritionally sound products and less likely to feel that ingredients in commercial pet foods were wholesome and nutritious. They are less likely to believe that pets live longer today because of good nutrition from commercial products, that commercial products contain necessary nutrition, and that pet food companies place a high priority on pet health and wellbeing. Owners feeding noncommercial foods were more likely to believe that raw bones could be safely fed to pets, that raw meat provides better nutrition than cooked foods, and that foods sold for human consumption provide better nutrition than do commercial pet foods. Owners feeding noncommercial foods also enjoyed preparing foods for their pets more than did owners feeding commercial pet foods.

Problems Associated with Homemade Diets

Veterinarians are the most commonly cited source for pet nutritional information; however, about 17% of pet owners cite the Internet as their primary source for pet nutritional information. Unfortunately, there is a considerable amount of misinformation present on the Internet, and it can be difficult to determine which information is trustworthy. In the telephone survey discussed previously, less than one-third of owners used a homemade diet recipe specifically designed for pets. In another survey, 90% of the homemade elimination diets used by veterinarians were not balanced and were not nutritionally adequate to support adult maintenance. In another study comparing the nutritional adequacy of commercial diets to homemade diets, calcium, the calcium/phosphorus ratio, and vitamins A and E were below current recommendations for nutritional adequacy in homemade diets. Potassium, copper, and zinc concentrations were also inadequate in homemade diets.

Feeding unbalanced homemade diets can lead to complications, including osteodystrophy, osteopenia, nutritional secondary hyperparathyroidism, and pansteatitis. Meat sources are typically high in phosphorus and low in calcium; if no calcium source is added to the diet, the calcium concentration is typically inadequate and the calcium/ phosphorus ratio is too low. Nutritional secondary hyperparathyroidism occurs when the parathyroid hormone concentration elevates in an attempt to raise the serum calcium concentration, and loss of bone density results. For further discussion of nutritional secondary hyperparathyroidism see Chapter 17, Diet and Endocrine Disease. Deficiency of dietary vitamin D can lead to type I rickets, characterized by osteodystrophy. Deficiencies in calcium and vitamin D are especially problematic in young, growing dogs, requiring a proper balance of calcium and phosphorus for bone growth. Certain ingredients can be very high in a particular vitamin and cause problems if not a part of a balanced diet. Liver is very high in vitamin A, and vitamin A toxicity can result in pets fed unbalanced diets based on liver. Pansteatitis (yellow fat disease) has been documented in cats fed diets with a high oily fish content and inadequate in vitamin E.

Some recipes call for the use of raw ingredients. Raw ingredients often contain bacteria that would normally be destroyed by cooking (see Chapter 2, Food Safety). The practice of feeding uncooked diets should be discouraged.

Formulating a Homemade Diet

Formulating a diet is a difficult task. The first step in doing so is to determine the nutritional requirements of the animal, and these requirements are based on species, life-stage, and the animal's special needs. The Nutrient Research Council (NRC) publishes a book about the nutritional requirements for various species, and these requirements serve as guidelines. The Association of American Feed Control

Officials (AAFCO) provides suggested nutrient profiles for dog and cat foods (see Chapter 3, Nutrients). Once the desired levels of nutrients are decided, then ingredients must be chosen that, in combination, will provide proper amounts of protein, fat, vitamins, and minerals. Nutrient databases must be maintained to provide the accurate nutritional analysis of each ingredient. Sophisticated computer programs containing human food ingredients are available (The Food Processor SQL, ESHA Research, Salem, Oregon), but these programs provide only a nutritional analysis of the combination of ingredients; they do not formulate a diet. The analysis of the combined ingredients must be compared to the suggested nutrient profile. If there are deficiencies or excesses, alterations to ingredients must be made and nutritional adequacy reevaluated. This can be a long and tedious process.

Some veterinary nutritionists offer a food formulation service or are available on the telephone for dietary consultations. Some of the veterinary nutritionists providing this service are listed in Table 1.1.

Assessing a Homemade Diet Recipe

When assessing a homemade diet recipe, there are some guidelines that can be quickly assessed. First, the five food groups (protein, carbohydrate, fat, vitamins, minerals) should appear in the recipe. Second, the carbohydrate source should be present in a higher or equal quantity to that of the protein source. Carbohydrate sources include rice, barley, lentils, potato, pasta, couscous, or quinoa. In cat foods, the carbohydrate-to-protein ratio should be 1:1 or 2:1, and in dog foods the ratio should be 2:1 to 3:1. Third, the protein source should be identified. Fourth, a fat source should be identified. Fat could take the form of an added vegetable oil or could be included in the meat source (chicken skin, fat in undrained ground beef, etc.). Fifth, a calcium or calcium/phosphorus supplement should be present. Calcium carbonate (baking soda) or bone meal (source of calcium and phosphorus) should also be present. Lastly, a source of vitamins and minerals should be present, typically in the form of a multivitamin tablet. For cat diets, a source of taurine should be present.

Choosing a Homemade Diet

There are many homemade recipe diets presented in the second section of this book. The first step in choosing a diet is to pick a species-

Table 1.1. Veterinary nutritionists offering nutritional consultation and/or homemade diet formulation.

Veterinary Nutritional Consultations, Inc.

http://www.petdiets.com Diet formulation and nutrition consultation

DVM Consulting

1-888-3Homemade http://balanceit.com Diet formulation

Nutrition Support Service

Michigan State University College of Veterinary Medicine, East Lansing, MI http://cvm.msu.edu/hospital/services/nutrition-support-service-1 Patients must be seen by the nutrition service at MSU

Nutrition Support Service

The Ohio State University College of Veterinary Medicine, Columbus, OH http://www.vet.ohio-state.edu/2727.htm Nutrition consultation and healthy weight clinic

Clinical Nutrition Service

North Carolina State University, College of Veterinary Medicine, Raleigh, NC (919) 531-6871 Korinn_saker@ncsu.edu

MJ Ryan Veterinary Hospital of the University of Pennsylvania

On-Line Nutrition Consultation Service for Veterinarians http://www.vet.upenn.edu/RyanHospital/SpecialtyCareServices/ Nutrition/NutritionConsults/tabid/1380/Default.aspx This service is for veterinarians only.

Georgia Veterinary Specialists

Susan G. Wynn, DVM

(404)-459-0903

http://www.susanwynn.com

Diet formulation for healthy pets; diet formulation for special health issues requires a veterinarian referral.

University of Florida, College of Veterinary Medicine Richard Hill, MA, VetMB, PhD, DACVIM, DACVN, MRCVS (352) 392-2226

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Table 1.1. (cont.)

Homemade diet formulation for Florida veterinarians. Pet must visit the University of Florida if there are special health issues.

Veterinary Nutrition Center

The University of Tennessee College of Veterinary Medicine (865) 974-8387 http://www.vet.utk.edu/clinical/sacs/index.php

Nutrition Support Service

William R. Pritchard Veterinary Medical Teaching Hospital

University of California, Davis

(530) 752-7892

http://www.vetmed.ucdavis.edu/vmth/small_animal/nutrition/default. cfm

Clinical Nutrition Specialty Service

University of Missouri Veterinary Medical Teaching Hospital http://www.vmth.missouri.edu/clin_nu.htm

University of Minnesota College of Veterinary Medicine

St. Paul, MN

http://www.cvm.umn.edu/VMC/

Nutritional consultations. Pet must visit the Clinic or be referred by a

veterinarian if there are special health issues.

appropriate diet for the life stage of the dog or cat (adult, growth, senior, reproduction, performance). Dog diets should not be fed to cats, as these diets will not contain the specific and unique nutrients that cats need. Cat diets should not be fed to dogs because these diets will usually provide some nutrients in excess for dogs. The second step is to determine if there are any special needs of the pet (weight loss, allergy, renal disease, heart disease, etc.). If special needs are present, then a diet specific for that condition should be chosen. A variety of diets using different combinations of ingredients are presented for each life stage and special condition so that substitutions are not necessary. It is best to provide the pet with a variety of dietary ingredients over time to ensure a proper mix of nutrients. The majority of diets in this book have been formulated to be balanced and nutritionally complete. However, some diets, such as those formulated for renal disease and other conditions are not nutritionally complete because of the severe dietary restrictions needed in some conditions.

If a diet is not nutritionally complete, this is stated in the diet recipe. These diets should *only* be fed to dogs or cats with that *specific* special condition and should *not* be fed to healthy pets.

Diet Preparation

Diets should be prepared according to the recipe given, with no substitutions, additions, or omissions. Each ingredient in the diet is important and provides specific necessary nutrients. Proper preparation of homemade diets requires time and effort. An accurate kitchen scale that measures in grams and ounces is required for diet preparation. Ingredients should be carefully measured to provide the proper combination of nutrients.

Individual ingredients in the diet (such as meat and the carbohydrate source) should be cooked separately. Meat should be cooked for a minimum of 10 minutes at 180°F. Chicken and ground beef, in particular, should be well cooked to prevent bacterial contamination. The use of raw ingredients is not recommended due to the increased risk for foodborne illness (see Chapter 2, Food Safety). Carbohydrate sources such as potatoes should be cooked to improve their digestibility. Vegetables should be washed and then cooked prior to use.

Once the food ingredients have been cooked, they should be measured and combined. Any salt in the recipe can be added at this time, but other vitamins and mineral supplements should not be added yet. Once the food ingredients are combined, the ingredients should be mixed in a blender to ensure their even distribution. This will prevent the pet from picking out certain dietary ingredients and not consuming others. An unbalanced diet will be consumed if ingredients are separate and the pet does not eat the entire mixture. Vitamin and mineral supplements should be crushed to a powder form and added after the food sources have been cooked and combined.

Homemade diets do not contain preservatives and are high in moisture, thus they are highly susceptible to bacterial and fungal contamination if left at room temperature for more than a few hours. The recipes in this book have been designed to be prepared in small batches to minimize the amount of food prepared but not required for feeding. Any prepared diet that is not being consumed immediately should be stored in an airtight container in the refrigerator for no more than a few days. If preparation of a larger batch of food is desired, then the recipe should be prepared up to the point of vitamin and mineral supplement addition and stored frozen. When ready to feed, the portion of diet can be thawed, weighed, and the appropriate amount of vitamins and minerals can be added prior to feeding. Before feeding any food that has been stored in the refrigerator or freezer, the color, odor, and consistency should be checked. If there are changes, or there is visible mold growth, the food should be discarded.

Vitamin and mineral supplements are present in small quantities, but they are a very important part of the diet. Supplements should be included as stated in each recipe and not substituted or omitted. For example, many diets include both iodized salt and a salt substitute (potassium chloride). Iodized salt is important as a source of iodine and sodium, and salt substitute is included as a source of potassium. Both are equally important for inclusion in the diet. Bone meal is included in diets because it is an excellent source of calcium and phosphorus, and calcium carbonate (baking soda) is included as a calcium source. Some recipes call for one-half of a vitamin or mineral tablet. In general, these are human products that are not meant to be cut in half, so each half may not be exactly half of the vitamins called for in the recipe. However, over the course of several days, the proper amounts of vitamins and minerals will be fed overall.

Prior to feeding, the diet should be warmed to just below body temperature (about 100°F). Especially if food is being warmed in the microwave, the food should be checked for hot spots, as the food may heat unevenly. A small amount of water can be added at this time, if necessary. When feeding, the food should not sit out at room temperature for more than a few hours. Any food not consumed should be removed and discarded. Bowls used for serving should be washed thoroughly after each use.

Monitoring

When feeding a homemade diet, monitoring is important, and the pet should be examined by a veterinarian at least twice yearly. Body weight, body condition score, and activity level should routinely be monitored so that adjustments to the amount of diet fed can be made. Hair and skin should be monitored, as these are good indicators of nutritional status. In addition, stool quality should be assessed. The prepared diets can also be evaluated by a laboratory for nutritional adequacy. Some laboratories providing this service are listed in Table 1.2.

Table 1.2. Selected commercial feed testing laboratories for pet food analysis.

Diagnostic Center for Population and Animal Health

Michigan State University, Lansing MI

Thomas H. Herdt, DVM, MS

herdt@cvm.msu.edu

http://www.animalhealth.msu.edu

Barrow-Agee Laboratories

Memphis, TN (901) 332-1590

http://www.balabs.com

Eurofins Scientific, Inc.

Des Moines, IA (515) 265-1461 http://eurofinsUS.com

Holmes Laboratory, Inc.

Millersburg, OH (800) 344-1101 http://www.holmeslab.com

Midwest Laboratories, Inc.

Omaha, NE (402) 334-7770 http://www.midwestlabs.com

Additional Reading

Diquelou A, Chaput C, Benoit E, and Priymenko N. 2005. Hypocalcaemia due to nutritional calcium deficiency and hypoparathyroidism in an adult dog. Vet Rec 156:45–48.

Freeman LM, Abood SK, Fascetti AJ, Fleeman LM, Michel KE, Laflamme DP, et al. 2006. Disease prevalence among dogs and cats in the United States and Australia and proportions of dogs and cats that receive therapeutic diets or dietary supplements. J Amer Vet Med Assoc 229:531–534.

Laflamme DP, Abood SK, Fascetti AJ, Fleeman LM, Freeman LM, Michel KE, et al. 2008. Pet feeding practices of dog and cat owners in the United States and Australia. Amer Vet Med Assoc 232:687–694.

Leon A, Bain SA, and Levick WR. 1992. Hypokalaemic episodic polymyopathy in cats fed a vegetarian diet. Aust Vet J 69(10):249–254.

Michel KE. 2006. Unconventional diets for dogs and cats. Vet Clin Small Anim 36:1269–1281.

Michel KE, Willoughby KN, Abood SK, Fascetti AJ, Fleeman LM, Freeman LM, et al. 2008. J Amer Vet Med Assoc 233:1699–1703.

Niza MMRE, Vilela CL, and Ferreira LMA. 2003. Feline pansteatitis revisited: hazards of unbalanced home-made diets. J Fel Med Surg 5:271–277.

Polizopoulou ZS, Kazakos G, Patsikas MN, and Roubies N. 2005. Hypervitaminosis A in the cat: a case report and review of the literature. J Fel Med Surg 7:363–368.

Streiff EL, Zwischenberger B, Butterwick RF, Wagner E, Iben C, and Bauer JE. 2002. A comparison of the nutritional adequacy of home-prepared and commercial diets for dogs. J Nutr 132:1698S–1700S.

Taylor MB, Geiger DA, Saker KE, and Larson MM. 2009. Diffuse osteopenia and myelopathy in a puppy fed a diet composed of an organic premix and raw ground beef. J Amer Vet Med Assoc 234:1041–1048.