UCDAVIS VETERINARY MEDICINE

Nutrition Support Service

Veterinary Medical Teaching Hospital
One Shields Ave, Davis, CA 95616-8747

Ph: 530-752-7892 / Fax: 530-752-7901
Email: nssvetmed@ucdavis.edu

Frequently Asked Questions

Our customized approach means that all cases receive individualized attention. Each case undergoes extensive medical record review, as well as evaluation of the dietary history including treats and supplements. The process can be quite involved, and includes research including scientific literature review as well as quantitative computer analysis of data. This process ensures the development of a comprehensive and truly customized nutritional management plan. *For home-cooked diets, it is important to understand that the more criteria that need to be considered for an individual patient (specific strategies for disease management, multiple diseases, owner preferences for specific ingredients or feeding philosophies, pet acceptance of flavors/textures, etc.), the greater the limitations on which ingredients are possible.*

Working with UC Davis Nutrition Support Service

How do I get the UC Davis Nutrition Support Service to help me?

For Veterinarians: Please call us if you have a question regarding nutritional case management. If your case involves the need for a customized management plan, including a parenteral solution, tube feeding plan, or home-cooked diet formulation, please visit:

http:// nutrition.vetmed.ucdavis.edu

Request forms for formulation can be downloaded and submitted either electronically or via fax. Pricing information for these services can also be found at this site. Please note all consults are billed directly to the requesting clinic and not the client. In addition all communication is conducted via the referring veterinarian, in order to adhere to regulations defining the establishment of a client-patient-veterinarian relationship. Members of the Nutrition Support Service do not speak with clients directly unless they are seen for an appointment at the Veterinary Medical Teaching Hospital in Davis.

For Pet Owners: Our service technician can answer general questions regarding pet food labeling and feeding your healthy pet. More in-depth questions are best handled with an in-person appointment that can be set up by calling 530-752-7892 or through a remote consult submitted through your veterinarian to the UC Davis Nutrition Support Service.

Why can't owners speak with the veterinary nutritionist directly?

The Nutrition Support Service is a support service, which means that it supports the referring veterinarian or clinician with the nutritional aspects of the case but does not have a direct client-patient-veterinarian relationship. Therefore, communications are best handled with the veterinarian that has the most familiarity with the case and can best evaluate how to use guidance from a variety of resources such as a radiologist, pathologist, and nutritionist.

If you would like to establish a direct client-patient-veterinarian relationship, this can be accomplished with an appointment at the Veterinary Medical Teaching Hospital in Davis, CA.

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Sources for Home-prepared Diet Recipes

Why are published recipes sometimes a problem?

The nutritional adequacy of many available 'generic' recipes is a concern. Recipes should be customized in part to take advantage of updated ingredient nutrient profiles, disease management strategies, or other concepts. Also, many generic recipes include vague supplement instructions like "one human multivitamin." Unfortunately, there are hundreds of such products with no standard formulation (and frequent reformulation of specific products), so the actual nutrient content may vary greatly and can change over time. It is common to see deficiencies and excesses of essential nutrients if in appropriate supplement products are used. In addition, ingredients that were once thought to be safe can later be found to be potentially toxic. The most recent example is grapes and raisins, which can cause renal failure in amounts easily consumed by dogs. Finally, nutritional knowledge is constantly evolving and published recipes may not incorporate that new knowledge. An example would be the benefits of long chain omega-3 fatty acids in a variety of conditions.

We have published the results of our studies on this topic; these document the concerns regarding nutritional adequacy of generic recipes. Please see:

Larsen JA, Parks EM, Heinze CR, and Fascetti AJ. Evaluation of recipes for home-prepared diets for dogs and cats with chronic kidney disease. *J Am Vet Med Assoc* 2012;240:532–538.

Stockman J, Fascetti AJ, Kass PH, and Larsen JA. Evaluation of recipes of home-prepared maintenance diets for dogs. *J Am Vet Med Assoc* 2013;242:1500-1505.

Who formulates the recipes that the Nutrition Support Service provides?

Recipes are formulated by veterinary nutrition residents under the guidance of faculty members of the Nutrition Support Service. Faculty nutritionists are Diplomates of the American College of Veterinary Nutrition (ACVN). These board certified specialists are uniquely trained in the nutritional management of both healthy animals and those with one or more diseases. Among other skills, veterinary nutritionists are qualified to formulate home-prepared diets, manage the complex medical and nutritional needs of individual animals, and understand the underlying causes and implications of specific nutritional strategies that are used to prevent and treat diseases. They use their expertise and clinical experience to review the specific history of each patient to make custom recommendations for the patient. Even when very similar nutritional concepts may be used for different patients, plans are refined to meet the patient's specific caloric needs and ingredient preferences.

Data Used For Formulating

Where does the nutritional information come from?

Most of the nutritional data comes from the USDA National Nutrient Database but is supplemented with many other resources and databases.

What nutritional requirements are used when formulating?

Recipes are created by checking the 40 or so essential nutrients against the nutrient profiles established by the Association of Animal Feed Control Officials (AAFCO) and/or the 2006 National Research Council (NRC) Nutrient Requirements of Dogs and Cats.

Energy Requirement/Determining How Much To Feed

How is the amount of calories to feed determined?

The Nutrition Support Service uses standardized equations for calculating a pet's energy requirement or uses a patient's detailed diet history to determine their actual caloric needs. Using a detailed diet history is preferred because it is the most accurate method to determine a pet's individual caloric needs. Using an equation that calculates a patient's energy requirement based solely on body weight, although acceptable, carries a greater potential to either over- or underestimate a pet's energy requirement by as much as 50%. Therefore, if a recommendation is based on body weight it is more likely that the amount fed will need to be adjusted to maintain/achieve an ideal body weight or condition.

What is an ideal weight for a pet?

The Nutrition Support Service uses a 9-point body condition system that has been validated using more precise methods of determining how under- or overweight a patient is. This system assigns a score based on the degree of fat that has accumulated over the ribs and in the abdomen. Patients that are at an ideal weight have ribs that can be felt but that are not easily seen and have a tapered waistline are assigned a "4" or "5" for dogs, and a "5" for cats, both on the 9-point scale. Extremely underweight pets are a "1" while grossly obese pets are a "9".

Recipe Components

Our nutritionists will create one customized recipe specifically for your pet, based on the medical and dietary history provided. If medically indicated, additional recipes may be requested for an additional fee.

Why are specific foods selected for the recipes?

Attempts are always made to select ingredients that the patient will find palatable and tolerable in cases where there are concerns of food allergy. In addition, every attempt is made to use foods that can be the most easily purchased. Specific forms of the foods are used as even subtle differences in preparation or different cuts or processing of foods can drastically change the nutritional profile of a food. Therefore, foods must match the recipe description exactly. It is not appropriate to boil meat that is to be baked per the recipe. In addition, using a different cut like thigh meat instead of chicken breast must be avoided. Adding oils or flavorings when cooking grains, pasta, or potatoes should be avoided unless the recipe specifically directs the addition of these seasonings.

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Can foods be substituted? What about treats?

Although variation is an appealing concept, it must be carefully done and is not necessary for a balanced diet. In fact, seemingly simple substitutions can throw a diet off balance and potentially create deficiencies or excesses. For example, using ground beef instead of turkey breast would drastically change the calories, protein and fat content of a recipe. Even changes that seem subtle can be problematic. For example, using a pork shoulder instead of pork loin can drastically increase the fat content of a recipe while decreasing the protein content. Therefore, a veterinarian or veterinary nutritionist should be contacted about changes in a recipe or additional recipes should be requested at the start if a variety of different recipes is desired.

In some cases a treat allowance can be incorporated to accommodate snacks as well as adding variety to the daily meals. Typically, treats can be given to patients on home-cooked diets if they have been reviewed (and possibly adjusted) by the referring veterinarian and/or veterinary nutritionist. However, in some cases treats are not recommended to better clarify the pet's response to the new diet. Sometimes recommendations will be given to stop treats at least temporarily in cases where there is a concern about the specific treat or where a history of food allergy is reported. Usually specific treat recommendations and amounts will be provided.

Can any vegetable oil be used?

Corn oil is often used (especially in lower fat formulations) as it is rich in the essential fatty acid, linoleic acid. Other fat sources (canola oil, butter, etc.) are lower in linoleic acid, and larger amounts are needed to meet this requirement. These fat sources are sometimes used in diet formulations with higher fat levels, but ingredients are not directly interchangeable due to the variation in fatty acid content. All recipes are formulated to meet or exceed essential fatty acid requirements regardless of the specific fat source, so the recipe must be followed exactly to avoid deficiency. Also, we have not recognized any problems associated with using corn oil even in patients with adverse reactions to corn.

Why have the specific supplements been used?

The supplements have been selected for a variety of reasons. In the case of human supplements they have been selected for their wide availability and specific formulation. For example, NOW Daily Vits Multimineral/vitamin supplement is frequently used since it uses a bioavailable form of copper (copper sulfate) rather than copper oxide which pets cannot use as a source of copper, but is commonly found in other major, national human supplement brands. It also happens to have a relatively good balance of nutrients even though it is not designed for pets.

In the case of many animal multivitamins/multivitamin products, they are not complete or concentrated enough in essential nutrients to be used when making home-cooked pet food. Most animal supplements are designed to be added onto commercial complete and balanced pet food and, therefore, keep essential nutrients at a lower level to prevent the creation of nutrient excesses others have unnecessarily high levels of some nutrients like vitamin D.

Can supplements be substituted?

Supplements vary greatly and substituting supplements is never recommended as it can lead to nutritional deficiencies and excesses. If particular brand name supplements are specified these should be used as directed.

However, in some situations the use of generic supplements is specified. In this case, if the strength of the tablet cannot be found, the total amount of the nutrient should still be included. For example, the recipe may specify the inclusion of 2 tablets containing 500 mg of choline each (total of 1000 mg choline). If only tablets containing 250 mg of choline can be found, then 4 tablets will be needed to achieve the amount needed in the recipe (total of 1000 mg choline).

Where can I find the supplements for purchase?

Most of the human supplements can be purchased online or at a drugstore or supermarket. The Balance IT supplements can be ordered online at balanceit.com or by calling 888-346-6362 and placing the order over the phone. If a special veterinary code is needed for ordering Balance IT (some are only sold under the supervision of a veterinarian) that code will be provided with the recipe formulation. Specific fish oil brands are specified since the amounts of long chain omega-3 fatty acids and vitamins A & D is known as well as whether the product is tested for pollutants/contaminants such as PCBs, dioxins, and mercury.

If specific supplements are desired an additional charge may apply for their use and a delay may occur to allow for the time it takes to research and then enter the supplement into the database.

Are some of the recipe's ingredients redundant?

Although some ingredients may seem redundant they all have a purpose and cannot be eliminated from the recipe. For example, there may be more than one source of salt in the recipe but they may be added to provide the right proportions of sodium, chloride, potassium, and iodine. Using a variety of supplements prevents excesses in other nutrients that would otherwise be added if only one supplement was used. For example, if a calcium and phosphorus containing supplement was used as the sole source of calcium it might lead to adding unnecessary and even harmful levels of phosphorus. Likewise, adding only one type of salt might lead to an excess of potassium to meet the sodium requirement.

What nutrients do the ingredients provide?

Ingredients:	Source of:
Meat/Vegetable Protein	Protein & Amino Acids
Grain/Pasta/Potatoes	Energy & Fiber
Vegetable Oil	Linoleic Acid
Fish Oil	Long-chain Omega-3 Fatty Acids
NOW Daily Vits Multimineral/vitamin	Vitamins & Minerals
Balance IT	Vitamins, Minerals & Amino Acids

Freeda Calcium Phosphate Powder	Calcium & Phosphorus
Tums/Calcium Supplement	Calcium
Morton Iodized Salt	Sodium, Chloride & Iodine
Morton Lite Salt Mixture	Sodium, Chloride, Potassium & Iodine
Morton Salt Substitute	Potassium & Chloride
Copper Supplement	Copper
Choline Supplement	Choline
Zinc Supplement	Zinc
Taurine Supplement	Taurine
Vitamin B12 Supplement	Vitamin B12
Metamucil	Soluble & Insoluble Fiber

Considerations for the use of raw animal products in pet diets

Using raw animal products (eggs, organs, or skeletal muscle) in home-prepared diets for dogs and cats is popular, and is often promoted as being a beneficial practice. However, such diets present risks related to nutritional adequacy as well as the presence of pathogenic microorganisms, while no nutritional advantage has been documented. Any benefits related to palatability, digestibility, or energy density in addition to owner preferences regarding avoidance of preservatives and control over ingredients can also be accomplished with the use of a properly formulated, home-cooked diet. In this way, the risks related to both nutritional adequacy and pathogenic microorganisms can be controlled.

Meat purchased for human consumption from supermarkets is often contaminated with *Campylobacter, Escherichia coli* and *Salmonella*. Exposure of humans associated with the pet and its environment, or handling raw meat, are concerns, since people (especially children and immunocompromised individuals) may be more susceptible to enteric pathogens than our pets. Many food-borne pathogens can lead to serious or even life-threatening disease in humans. Documented illnesses in animals have been reported; however, even in the absence of clinical illness, fecal shedding of the pathogenic microorganisms by the animal is also an important concern.

Another problem encountered with home-prepared raw diets is their nutritional imbalance. Moreover, nutrient bioavailability of some ingredients used in these diets may be unknown: for instance, the amount of calcium available from bones is unpredictable. Additionally, tooth fractures and gastrointestinal obstructions and perforations can occur. For these reasons, we do not recommend feeding raw animal products to pets under any circumstance.

Recipe/Food Preparation

I am not good at measuring in fractions; is there an easier way to measure?

The easiest and most reliable method to measure ingredients is to weigh them. Almost all recipes provide both the gram amount and the common measures such as cups, ounces and teaspoons,

and for some ingredients only weight measures in grams are possible (meat for example). *We strongly advise the use of kitchen gram scales, and these are required for many recipes.* Kitchen scales are widely available and can be purchased usually for less than $50.

It is important to also consider volume conversions. For example, 1/16th of an eight fluid ounce cup equals 1 tablespoon. Other common measure conversions include:

1 tablespoon = 3 teaspoons
1 pound = 16 weight ounces
1 weight ounce = 28.35 grams

Also note that "fluid ounce" is measure of volume and "ounce" is a measure of weight. Therefore, one ounce always represents the same amount regardless the type of food while one fluid ounce is dependent on the specific food's density. For example, one fluid ounce of water weighs more than one fluid ounce of oil (this is the reason why oil floats on water – its lighter), but one ounce of water and one ounce of oil weighs the same (the oil just takes up more space).

How do I prepare a batch of the home-cooked food?

Most recipes provide the amount of food that is to be fed daily (confirm this before batch cooking by checking the recipe). Thus, one can simply multiply the amount of each ingredient by the number of days that one wished a batch to last. It is often easier to use the gram amount of each ingredient for this calculation to prevent the need to multiply fractions. For example, if a recipe calls for 312 grams of chicken breast and a batch for one week or seven days is being made, multiply 312 by 7 to get the new amount of 2184 grams of chicken breast. One must be careful to multiply every ingredient to keep the exact proportions as called for in the recipe. See the storage FAQ for further information pertinent to batch cooking.

Commercial Food Options

Are there commercial diet options that might also work in my pet?

If a commercial diet option (or options) is readily available every attempt will be made to provide this option even before a formulation is made. This is typically a better option for many patients since commercial food is more consistent, less expensive, and more proven than any home-cooked diet. Some clients do not have the time or resources to cook for their pets, while others prefer it.

Feeding the Prepared Recipe

How quickly can I transition to the new food?

In general, a slow transition over at least 7 days is recommended when switching to a new food, and some pets are more sensitive to diet changes and do best with more gradual transitions. Transition can be accomplished by feeding a small amount of the new food on the first day while reducing the amount of the "old" food accordingly. Then slowly increase the amount of the new

food at each meal and decrease the amount of the old food until on the final day only the new food is being fed.

Can the recipe be fed to other pets in the household?

No. Recipes are custom formulated for the specific patient and may incorporate nutritional strategies that when fed to another pet could be harmful. For example, a recipe appropriate for a patient with kidney disease could lead to a phosphorus deficiency if fed to a healthy pet.

Storing Food

How long can I store a prepared home-cooked food?

Prepared home-cooked food can be stored in an airtight container in the refrigerator (32-40°F) for two to three days or frozen (<0°F) for up to three weeks (less if high in long-chain omega-3 fatty acids/fish oil). The amount of food for a single meal should be warmed prior to feeding if refrigerated or frozen to increase the palatability of the food (check that the food is not too hot before serving). Recipes are formulated without any preservatives and care should be taken to assess for spoilage (changes in color and odor) prior to serving. Any uneaten portion of food should be promptly removed within 30 minutes and either stored in the refrigerator for use later the same day or discarded. If the food is prepared in batches and stored in the refrigerator or freezer for future use, supplements should not be added to the batch but rather added to the food after warming but before serving. Heating the supplements can degrade or destroy essential nutrients.

Follow-Up and Monitoring

How often do I need to have my patient visit my veterinarian now that they are fed a home-cooked diet?

It is recommended that any pet fed a home-cooked diet be checked by a veterinarian at least every six months (animals with a concurrent medical condition may need to be seen more frequently as directed by your veterinarian). This visit should include an assessment of body condition, body weight, and physical examination and often tests such as blood work and urinalysis. It may also include specific diagnostic tests to determine how well the patient is responding to its medical and/or nutritional management.