

Raw or War: Homemade and Raw Food Diets

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HOMEMADE DIETS

Some owners prefer to prepare homemade foods - feel less guilty and have impression of preparing a "real meal" that is "more natural" and "more traditional". Nearly all dogs and cats in the US consume table foods at some time in their lives. Majority of dogs and cats in US receive > 90% of calories from commercial foods. When a client wants to prepare pet foods at home, it is important for veterinarians to understand the client's reasons and motivation. In many cases it is possible to address their concerns and to recommend an appropriate commercial food. If they still wish to cook, then proper guidance can be provided.

Some owners wish to cook homemade diets in order to provide a natural or organic food. Remember, there is no legal definition for the terms "natural" and "organic". Pet owners may also want to prepare vegetarian food for their dog or cat because they are vegetarian or vegan. Because cats are true carnivores, vegetarian cooking should be discouraged. Other owners wish to prepare homemade diets in order to avoid additives, preservatives, and contaminants. Pet food labels may be difficult to read and understand and they do not contain as much information as human food labels; therefore, some choose to home cook because they are more comfortable with being in control. Some pets will only eat table foods because it has become a habit. Lastly, homemade diets may be used for dietary elimination trials.

It is possible to achieve the same nutrient balance with a homemade food as with a commercially prepared food. However, this largely depends on the accuracy and competence of the person formulating the food, and on the compliance and discipline of the owner. Unfortunately, some homemade recipes are flawed even when followed exactly and consistently. IN one survey, 90% of homemade elimination diets prescribed by 116 veterinarians in North America were not nutritionally adequate for adult dog or cat maintenance. Few of the recipes available in books, magazines, and on-line have been tested to document the nutritional adequacy of the diet.

There are common nutrient problems in many homemade foods. Many formulations contain excessive protein, but are deficient in calories, calcium, vitamins, and micro-minerals. Commonly used meat and carbohydrate sources contain more phosphorous than calcium resulting in inverse calcium: phosphorous ratio. Foods designed by clients are commonly deficient in fat and energy density or contain an unpalatable fat source (vegetable oil). Homemade foods are rarely balanced for micro-minerals and vitamins because veterinary vitamin-mineral supplements are not complete nor are the nutrients well balanced within the product.

People are taught that eating a variety of foods is nutritionally sound. Clients often extend this principle to their pet's nutrition. Pet owners perceive that feeding a variety of foods is their best defense against malnutrition. Likewise, many owners feed a homemade diet because they can use a variety of ingredients. Some owners choose meat and carbohydrate sources for their pet's food based on their own preferences, product availability, or affordability. Other pets are fed "leftovers" such as fat trimmings, bones, vegetable skins, crusts, and condiments. Some owners feed their pets according to guidelines for humans not realizing that dogs and cats have different requirements. A common problem with homemade diets is that the vitamin-mineral supplement is left out because of inconvenience, expense, or failure to understand its importance - after all, many humans do not take vitamins. Lastly, some homemade diets use raw ingredients - we will talk more about these in a little bit

Veterinarians encounter a wide variety of pet food recipes from breeders and the popular press. Some owners want an opinion as to whether the recipe is good and others want to alter the recipe.

Homemade formulations can be checked for nutritional adequacy and adjusted using the "quick check" guidelines:

1. Do five food groups appear in the recipe?

- a. Carbohydrate/fiber source from a cooked cereal grain
 - b. A protein source, preferably of animal origin, or if more than one protein source is used, one source should be of animal origin
 - c. Fat source
 - d. Source of minerals, particularly calcium
 - e. Multivitamin and trace mineral source
2. Is the carbohydrate source a cooked cereal and present in a higher or equal quantity than the meat source?
- a. Carbohydrate to protein ratio should be at least 1:1 to 2:1 for cat foods and 2:1 to 3:1 for dog foods
 - b. Sources are cereal such as cooked corn, rice, wheat, potato, or barley
 - c. These sources have similar caloric contributions, but some carbohydrates contribute a substantial amount of protein, fiber, and fat
3. What is the type and quantity of the primary protein source?
- a. Overall protein quality of the diet can be improved by substituting an animal-derived protein source for a vegetable protein
 - b. Skeletal muscle protein from different species have similar amino acid profiles
 - c. Final food should contain 25–30% cooked meat for dogs (1 part meat to 2–3 parts carbohydrate) and 35–50% cooked meat for cats (1 part meat to 1–2 parts carbohydrate)
 - d. Providing some liver in the meat portion is recommended once a week or no more than ½ of the meat portion on a regular basis - corrects most potential amino acid deficiencies and contributes fatty acids, cholesterol, energy, vitamins, and microminerals
 - e. If owner requests an ovo-lacto-vegetarian food, eggs are best
 - f. If vegan food is requested, soybeans are the next best, but incomplete, amino acid profile
4. Is the primary protein source lean or fatty?
- a. Lean protein sources require addition of an animal, vegetable, or fish fat source at 2% of the formula weight for dogs and 5% of the formula weight for cats
 - b. If a homemade food lacks sufficient caloric density, addition of cooked beef or chicken fat, poultry skins, vegetable or fish oils can markedly increase caloric density without adding other nutrients
5. Is a source of calcium and other minerals provided?
- a. An absolute calcium deficiency is common
 - b. Many owners erroneously assume cottage cheese, cheese or milk added in small quantities provides adequate calcium
 - c. Most foods require a specific calcium supplement
 - i. When the protein fraction equals or is greater than the carbohydrate fraction, usually only calcium carbonate is added (0.5 g/4.5 kg cat/d and at least 2.0 g/15 kg/dog/d)
 - ii. Calcium and phosphorous supplementation may be necessary when the protein fraction is less than the carbohydrate fraction. Steamed bone meal, dicalcium phosphate, and certain proprietary mineral supplements contain @ 27% calcium and 16% phosphorous (about 2:1) and micro-minerals.
6. Is a source of vitamins and other nutrients provided?
- a. A human adult over-the-counter vitamin-mineral tablet that contains no more than 20% of the recommended daily allowances for people works well for both dogs and cats at ½ to 1 tablet per day (@ 1 gm/tablet)
 - b. One tablet per day of a human adult product will not over-supplement pets with calcium, phosphorous, magnesium, vitamins A, D, and E, iron, copper, zinc, iodine, and selenium according to AAFCO maximum allowances for canine and feline foods
 - c. In general, veterinary supplements provide between 0–300% of vitamin-mineral requirements of dogs and cats

Substitution of ingredients can be done, but should be researched as to the equivalent amounts. One protein source is not the same as another. Other instructions that should be given owners include those for preparation, storage, and feeding. Emphasis should be made to not eliminate an ingredient or indiscriminately substitute ingredients. Owners that wish to use raw eggs and meats should be informed that there is a risk for infectious diseases. Animal ingredients should be cooked for at least 10 minutes at 180F. Vegetable ingredients should be washed or rinsed and cooked if increased digestibility is desired. Since antioxidants are not usually added to homemade diets, storage in airtight containers at refrigeration temperature can be done for 7 day stretches. Large quantities can be frozen. Owners should check appearance and odor daily to make sure rancidity or contamination has not occurred. Starches should be cooked to increase digestibility; however, they should be cooked separately from the protein source. Carbohydrate sources require a longer cooking time; meat and liver should not be overcooked or protein denaturation will occur

Pets should be evaluated routinely whether they are being fed commercial food or homemade food. Stools should be formed although they may contain more water. Body condition and weight should be maintained. If problems are encountered, then either the homemade diet should be re-evaluated and modified or use of a commercially available diet should be encouraged.

RAW FOOD DIETS (BONES AND RAW FOOD OR BIOLOGICALLY ACTIVE RAW FOODS)

Veterinarians deal with pet owners who have access to a large body of information on small animal nutrition. Food is something that everyone relates to because it is one of the necessities of life. Food can have important effects on psychological well-being. Diet is something that an owner can control. Nutritional therapy is viewed as natural and holistic as opposed to surgical and pharmacological management of disease. For these reasons, there are a growing number of homemade diet recipes available through the internet and published sources that tout health benefits.

An example of a non-traditional pet food is raw food diets. Proponents of raw food diets claim numerous benefits such as improvement in coat and skin; elimination of breath, body, and fecal odor; improvement in amount of energy and behavior; improvement in overall health and immune function; and reduction of the incidence of many medical conditions including allergies, arthritis, pancreatitis, and parasitism.

The rationale for use of raw food is simple. Dogs and cats are carnivores that evolved eating raw foods. In addition, commercial foods are heat processed which alters or destroys nutrients and essential enzymes. Therefore, commercial foods may not be a natural or nutritionally sound diet for dogs and cats.

There are three major categories of raw food diets:

1. Commercially available raw food diets. These diets are intended to be complete and balanced without the need for additional supplements. These diets are typically sold in frozen form.
2. Homemade complete raw food diets. Many recipes for homemade raw food diets are available in books and articles as well as on the internet. The three most popular homemade raw food diets are the bones and raw food (BARF) diet, the Ultimate diet, and the Volhard diet.
3. Combination diets. These consist of commercially available grain-and-supplement mixes. The grain mix is fed in combination with raw meat.

Although there are numerous health claims for these diets, there is no scientifically proven information, only testimonials. There are several serious potential drawbacks to these diets.

Nutritional imbalances. In one small study, raw food diets were found to have one or more of the following: an unbalanced calcium-to-phosphorous ratio, increased vitamin D levels, decreased potassium content, decreased manganese content, decreased or increased zinc content, decreased iron content, and increased vitamin E content.

Intestinal foreign bodies. There are sporadic reports of esophageal foreign body and obstruction due to ingestion of bones.

Infectious agents. Raw foods, especially meat, may contain infectious agents, many of which are zoonotic. *Escherichia coli* O147:H7 was cultured from one homemade raw food diet. In one study,

approximately 50% of raw food diet contained non-type specific *E coli* while these were not found in commercial dry foods. In another study, *E coli* was identified in 15/25 (64%) diets; however, *E. coli* O157 was not detected. *Salmonella* spp. were detected in 5/25 (20%) diets. *Clostridium perfringens* was identified in 5/25 (20%) samples. A toxigenic strain of *C. difficile* was isolated from one diet. *Staphylococcus aureus* was isolated from 1/25 (4%) diets. *Campylobacter* spp. were not isolated from any of the diets. Raw pork may contain *Yersinia enterocolitica* 4/O:3 and has been isolated from feces of dogs and cats fed raw pork. *Listeria monocytogenes* has also been isolated from raw pork and has been associated with disease in dogs including reproductive problems. Rendered raw meat has been shown to be contaminated with bacteria, including *Salmonella* spp, (in one study 80% of raw food diets cultured positive), *Proteus* spp, and *Pseudomonas* spp, that may also be carried by flies. *Clostridium difficile* has been isolated from feces from dogs and cats. In addition to bacteria, raw foods may contain *Toxoplasmosis*, *Trichinella*, and other parasites including *Echinococcus*. These may pose health hazards to animals as well as to the humans who are preparing the food. One argument given by raw food proponents is that the bacteria do not cause disease in dogs or cats. One concern that is often overlooked is the role of dogs and cats to be carriers of potentially zoonotic infectious agents. For example, dogs have been shown to carry *Escherichia coli* that can cause non-enteric *Escherichia coli* infections in human beings. In addition, indiscriminate use of antimicrobials may result in antimicrobial resistance of enteric organisms, which, in turn, may find its way into human medicine.

There are some publications mainly case reports concerning consumption of raw foods or raw food diets by dogs and cats and reviews expressing opinions concerning raw food consumption by dogs and cats. Cases and case series include: anestrus due to hyperthyroidism associated with consumption of raw meat, hyperthyroidism and associated signs due to consumption of raw meat and glands, hypervitaminosis A in cats resulting in cervical ankylosing spondylosis and hepatic fibrosis, septicemic Salmonellosis in cats fed a raw chicken diet, and diarrhea associated with Salmonella in cats fed raw meat. However, there is a controlled study of growth in kittens fed a homemade raw diet, commercial raw diet, and commercial heat-processed diet that showed decreased stool volume and improved fecal consistency, better overall weight and body composition gain, and no adverse effects including infections in kittens fed the raw chicken homemade diet. There are other known or potential benefits of homemade especially raw food diets: they are typically limited ingredient diets and so may help with food allergies or intolerances, they are more digestible and so decrease on amount of food fed as well as amount of fecal matter produced, they are not processed and so may be beneficial in certain situations as processed foods have been linked to certain diseases and clinical conditions in humans, and owners have a sense of control over what they feed their pet.

So what kind of recommendation do we make to clients? There are two issues that require resolving when dealing with raw food diets and clients who wish to feed them. First, we must decide whether we believe in their use and feel comfortable in providing advice concerning their use and preparation. Second, we must provide competent advice on their use. These issues extend beyond health issues for dogs and cats to health issues with the human beings that share the same environment and prepare the food. Clients should be made aware of the potential for problems especially infectious diseases associated with raw food diets and hygiene should be emphasized. Raw food diets should be kept on a bottom shelf in the freezer or refrigerator to prevent contamination of other foods and if possible the raw pet food should be kept in a separate refrigerator. Separate food preparation bowls and utensils should be used and they should be washed as soon as possible after using. Homes with young children or immunocompromised adults should be strongly scrutinized concerning risk-benefit to the pet. Most important - good hygiene and common sense.

Standard Pet Formula - adequate for healthy dogs and cats over 6 months of age - from Veterinary Information Network (Susan Wynn, Claudia Kirk, Joe Bartges, Craig Datz)

1 pound fresh boneless skinless chicken breast

2 and 2/3 cup cooked white rice

1 Tablespoon safflower oil

1/4 tsp Morton's lite salt

1/4 tsp iodinated salt

3 grams of calcium carbonate without vitamin D (regular Tums - check size)

1 Centrum adult multivitamin-mineral supplement (no special senior, ocular, women's or other versions)

1/4 tsp taurine powder (or 500 mg tablet) (taurine is optional for dogs - essential for cats)

Sauté chopped chicken breast in oil until thoroughly cooked. Add rice and salt. Grind Tums (calcium carbonate), multi vitamin/mineral tab, and taurine supplement together. Add to cooled mixture. Store in refrigerator. Larger batches may be prepared in advance and stored in the freezer.

Nutritional profile

- 40% protein (Dry matter basis (DMB))
- 12% fat DMB
- 6% calcium DMB
- 4.3% phosphorus
- 1.4:1.0 calcium:phosphorus
- Calories: 1046 kcal per batch or 1.12 kcal/gram
- Batch size: 932 grams

To feed, calculate caloric needs and divide into twice daily feeding. One recipe batch should provide adequate intake for a 40-45 pound dog for 1 day. Adjust intake to maintain ideal body weight

There are many resources available that can be found at the American College of Veterinary Nutrition web site (www.acvn.org).