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**CANINE NUTRITION**

***What is AAFCO and why is it important?*** ([www.aafco.org](http://www.aafco.org/))

The Association of American Feed Control Officials (AAFCO) is an organization which oversees the entire pet food industry. It does not endorse any particular food, but it will certify that a given pet food has met the **minimum** requirements for nutrition. Most – but not all - of the commercial pet foods will have met AAFCO’s requirements and somewhere on the bag you can find a statement stating this.

Some food manufacturers will take another step under AAFCO regulations and have their food tested by feeding trials, meaning not only is the nutrient content assessed, but any nutrient loss due to processing and digestibility is also evaluated. When feeding trials have been performed, the label should read, **"Animal feeding tests using AAFCO procedures substantiate that Brand X provides completed and balanced nutrition for growth (or maintenance)."** These foods are considered better in that they have been more thoroughly evaluated.

***There are lots of choices of dog foods. What should I feed my dog?***

That is a great question. People nowadays have been looking much closer at the impact of nutrition on human health and it has sparked pet owners to question what is truly best for their dogs.

Unsurprisingly, some dog foods are marketed to appeal to owners and make eye-catching claims however they do not offer nutritional advantages. Sometimes foods are sold at a higher cost to make people believe they are better though in truth may not be.

Our goal is to make you a smart shopper and give you the tools to evaluate any diet that piques your interest. We do not endorse any single pet food company because we realize 1) each patient is unique and may have individual preferences or adverse reactions to certain foods, and 2) many factors, such as life stage, body condition, exercise, environment, health status and cost can influence what diet is ideal for your pet during different times in its life. The basics to picking a good diet are summarized below and then detailed later in this handout.

**THE BASICS TO PICKING A GOOD DIET**:

1) As stated already, we recommend a food that has an **AAFCO statement** stating the **food has been tested using AAFCO feeding trials/tests**.

2) We recommend companies that have a boarded Veterinary Nutritionist on staff. Veterinary Nutritionists are Diplomats of the American College of Veterinary Nutrition (ACVN).

3) We recommend a diet designated for your dog’s age: feed “growth” diets to growing pets until they are 90%-fully grown; feed “maintenance” diets to older pets.

4) We recommend a diet suited for your dog’s breed; small, medium and large breeds can have unique requirements, especially as puppies.

5) Learn the basics at interpreting pet food label terms. There’s a good deal of misconception and confusion when it comes to labeling.

6) We recommend contacting a pet food manufacturer with the following questions:

 Do you have a board-certified veterinary nutritionist or PhD nutritionist on staff full-time in your company? What is his/her name and are they available for consultation or questions?

 Who formulates your diets and what are their credentials?

 Which of your diet(s) are tested using AAFCO feeding trials, and which by nutrient analysis?

 What specific quality control measures do you use to ensure the consistency and quality of your product line?

 Where are your diets produced and manufactured? Can this plant be visited?

 Will you provide a complete product nutrient analysis for any dog or cat food of interest, including digestibility values and caloric density?

 What kinds of research on your products have been conducted, and are the results published in peer-reviewed journals?

\* Have any of the diets ever been recalled? Can you provide the details on this?

***Should I feed a “puppy” diet or an “all life stages” diet?***

Although in theory "all life stages" diets are appropriate for puppies, some of these products have calcium concentrations and caloric densities that would make them potentially dangerous to feed to large breed puppies. We recommend feeding puppy foods labeled as “growth” diets for this reason.

***Should I feed dry or wet food?***

Feeding a dry, canned, or semi-moist form of dog food is acceptable. Each has advantages and disadvantages.

Dry food is definitely the most inexpensive. It can be left in the dog's bowl without drying. The good brands of dry food are just as nutritious as the other forms.

Semi-moist and canned foods are also acceptable and can be high-quality. They often are also more appealing to the dog's taste. They are not however always more nutritious. Some semi-moist foods are high in sugar. In addition sometimes dogs fed very tasty wet foods become dogs with finicky appetites lifelong.

***Is it ok to feed my dog table foods?***

Table foods are generally not recommended because it takes away from the ideal, which is feeding a known well-balanced dog food. If you choose to give your dog table food, be sure that **at least 90% of its diet is a good quality commercial dog food**.

If you are inclined to give table foods on occasion, be aware of the common ingredients in a kitchen that are considered toxic to pets: **grapes, raisins, garlic, onions, and bones**.

For individuals committed to feeding their dog a human food homemade diet long term, we recommend consulting a **Veterinary Nutritionist**.

Veterinary nutritionists are Diplomats 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. They are qualified to formulate home-prepared diets and manage the complex medical and nutritional needs of individual animals. You should use this professional to ensure any diet you’re feeding your pet is well balanced. Aside from the basics, such as providing an appropriate source of protein and fat, a diet should be evaluated to ensure it’s **not missing nutrients** important to your dog.

For example, one common problem Veterinary Nutritionist encounter in many home-prepared diets is the lack of an appropriate source of essential omega-6 fatty acids, especially linoleic acid (LA). Some protein and carbohydrate sources will provide LA (such as fatty cuts or skin of chicken, quinoa, or oatmeal), but many do not. Other times, levels of calcium, taurine, zinc, potassium, and other essential micronutrients are not balanced.

Preparation instructions for your homemade diets should also be evaluated. For example, the nutrient profile of the final diet will be affected by whether salt is included when boiling pasta or rice and whether fat is drained or retained when cooking meats.

The bottom line is that dogs are not small humans and their nutritional demands are different from ours. There is no harm in feeding human foods if it’s done well. For a consult with a Veterinary Nutritionist, check out: www.petdiets.com.

***How often should I feed my puppy?***

One option is to provide “meal feeding.” This means that the puppy is fed at specific times of the day. This is best done for medium, large and giant breed dogs. A measured amount of food should be offered four times per day for 5-12 week old puppies. What is not eaten within 30 minutes is taken up. Puppies fed in this manner generally begin to cut themselves out of one of those meals by 3-4 months of age and perhaps another one later. If a meal is ignored for several days, it should be discontinued.

Another option is “free choice feeding” which means that food is available at all times. This works well with dry foods and for some dogs. Of particular importance, we recommend all **toy breed dogs** be fed this way and this can also be considered for small breeds as well. Toy breed puppies have a predisposition towards developing **Juvenile Hypoglycemia**, a condition whereby a puppy has a low blood sugar crisis because their liver is still immature and not quite adept at keeping the blood sugar levels stable in between meals. Precipitating events for this condition include inadequate nutrition, once or twice daily feedings (relatively long gaps between meals), gastrointestinal parasites, and cold ambient temperature. Note Juvenile Hypoglycemia is a transient condition that occurs predominantly in toy breeds of dogs between 6 weeks and 1 year of age. These pets normalize as adults. Signs to watch for if your puppy is susceptible to hypoglycemia (a low blood sugar crisis) include: nervousness, trembling, panting, rapid heart rates, weakness, wobbly gait, mental dullness, collapse, stupor, coma, or seizures. Contact us immediately if you have any concerns.

***When should I transition my puppy to an adult food?***

As a general rule, we typically recommend the transition around 1 year of age which is suitable for many breeds. The ideal is to transition a puppy to an adult food when the animal is fully grown (or at least 90%), which occurs anywhere from 9 months to 2 years depending on breed – the larger breeds tend to grow for longer periods so would benefit from growth diets for a longer duration

***Is the ingredient list a good way to determine the quality of a pet food?***

Checking an ingredient list is unfortunately not enough to determine the quality of a pet food. Ingredients are listed on labels in order of weight, including water, and this does not necessarily rank which ingredients are providing the most nutrients to a given food. (Some manufacturers purposefully provide ingredients based on their water weight to influence the order in which ingredients are listed). Remember pets require nutrients, not ingredients. A diet full of great sounding ingredients can be less nutritious than a diet containing ingredients less appealing to people. Marketing folks will always be creating labels to target what humans consider pleasing but I always encourage following the guidelines listed under, “The Basics of Picking a Good Diet.” There are some foods with a stellar ingredient list but no AAFCO statement and others that may have met AAFCO standards but fall short when evaluated more thoroughly with a call to a manufacturer.

***Can I use the guaranteed analysis to accurately compare pet foods?***

No, but we can teach you how.

The guaranteed analysis is required to give the minimum content of protein and fat in the food and the maximum content of fiber and moisture. Other nutrients may also be listed but are not required. This means only a limited number of nutrients you might be interested in may be on the label and overall you may not be getting the information you actually what about a nutrient. For example, in a dog that requires dietary fat restriction, a minimum fat level of 3% listed on the label does not tell you exactly how much fat the diet contains; it might contain 3% but it might contain much more.

Another confusing aspect of interpreting the guaranteed analysis is that nutrient levels in are listed on an **"as fed" basis**, which includes the water in the food (therefore, the protein level of a dry food will appear to be much higher than the protein level in a canned food, even if the levels on a dry matter basis are exactly the same).

A much more accurate way to compare foods is to compare them on **a gram or milligram per 100 kcal basis**. This information should be available from the manufacturer whose name and address must be listed on the label. The contact information for the manufacturer is one of the most useful pieces of information on the label. A company should be able to provide any nutritional information that you might require for your pet. If a company cannot or will not provide you with a piece of nutritional information- which we have encountered when calling various companies -we would consider that to be a red flag.

***Should I get foods that are “natural”,*** *"****organic****,"* ***"human grade", “premium”, "holistic", and/or "gourmet?***

**“Natural”** diets are generally good – as long as they measure up when evaluated under the criteria listed under “The Basics of Picking a Diet”- and the term “natural” is meaningful. The AAFCO definition for natural is "a feed or ingredient derived solely from plant, animal or mined sources, either in its unprocessed state or having been subject to physical processing, heat processing, rendering, purification, extraction, hydrolysis, enzymolysis or fermentation, but not having been produced by or subject to a chemically synthetic process and not containing any additives or processing aids that are chemically synthetic except in amounts as might occur unavoidably in good manufacturing practices." The term natural should only be used to describe products as a whole when all of the ingredients and components of ingredients meet this definition. An exception is made to allow the use of chemically synthesized vitamins, minerals, or other trace nutrients; however, a disclaimer must be present to inform the consumer that these supplemented nutrients are not natural (e.g., "natural with added vitamins and minerals").

The term **"organic**" refers to the conditions under which the ingredients used in products, and the product itself, were produced and must be consistent with regulations developed by the United States Department of Agriculture (USDA) National Organic Program. Current regulations covering organic products do not apply to pet foods, but the USDA is developing regulations for organic labeling of pet foods. Because no official rules have been adopted by AAFCO currently, there are some products that use the term "organic" more loosely than processed human food specifically with regard to the percent inclusion of organic ingredients.

Other descriptors, such as **"human grade", “premium”, "holistic", and "gourmet",** have no legal definition for pet foods however are powerful marketing terms. Once a product is destined for inclusion in pet food, it is no longer fit for human consumption by definition so “human grade” is not considered a useful or appropriate term by AAFCO.

The bottom line is products can be labeled with attractive terms but can have widely variable nutritional profiles, micronutrient concentrations and ingredient types. They are not required to be of superior quality in any way or to contain different nutrient levels than other products.

***Where do proteins in commercial pet foods come from? What are by-products?***

Animal protein in reputable pet foods provides highly digestible sources of essential amino acids. Major pet food companies contract with specific, known suppliers and use animal proteins from USDA-inspected plants and associated rendering facilities.

According to AAFCO, meat by-products are "the non rendered, clean parts, other than meat, derived from slaughtered mammals. It includes, but is not limited to, lungs, spleen, kidneys, brain, livers, blood, bone, partially defatted low-temperature fatty tissue and stomachs and intestines freed of their contents. AAFCO definitions of mammal by-products **specifically exclude, “**hair, hooves, horn, hide trimmings, manure and intestinal contents, as well as anything that is not specifically part of the carcass".

Organ tissues can be nutritious and are certainly eaten in the wild however by definition, meat or poultry by-products can include less digestible tissues, and meat by-products can include "animals from any source". The nutritional quality of by-products, meals, and digests can vary from batch to batch. This means that like all ingredients, the quality of by-products can vary, so it is important to select manufacturers who have stringent internal quality control standards. There is no reason to vilify by-products but rather find out more from the manufacturer about what quality of by-products are being produced.

Pet food companies have the ability to control quality and content of the by-products that they buy. This is done by contracting with specific suppliers that source their meats and by-products from USDA-inspected slaughter houses and deliver a pre-defined quality of meats and meals. A high quality pet food company will establish quality specifications and partner with suppliers for their ingredients in order to assure a consistent supply of high quality ingredients, including various meat and poultry by-products and meals.

***Can I feed my pet according to the feeding directions on the label?***

Pet food labels must list feeding directions. Feeding guidelines may overestimate the amount a dog or cat should eat therefore, feeding directions should be used only as a starting point and we encourage owners to make adjustments to keep the pet in trim body condition. Start at the lower end of the recommended range for most animals (even lower if they have a low activity level) and then carefully monitor body weight for the first several weeks on the new diet so that adjustments can be made as needed.

***I was advised to get my dog on a light food. Why can’t I find calorie content on the food label? Are over-the-counter “light”, “low calorie”, “weight management”, and “indoor formula” foods all the same?***

A pet food is not required to state its calorie content unless it is labeled as "light," “lite” or "low calorie". For example, a dry dog food labeled as “light” must contain ≤ 3100 kcal/kg according to AAFCO standards. Other terms like ***“weight management”*** *and* ***“indoor formula”*** don’t have to abide by any rules for calorie restriction so can be very variable in terms of how “light” they actually are.

Our hospital can also discuss weight loss prescription diets with you. They are very nutritious and highly effective at providing weight loss for your pet. They typically allow a patient to eat a nice volume of food yet still lose weight.

***Are their breed specific diet recommendations?***

With well over 100 breeds of dog in existence, varying substantially in size, purpose, conformation, and genetics, it makes sense to take into account their different metabolic rates, and growth rates and the implications they have on your puppy’s nutrition.

Small Breeds

Small and toy breeds have a higher energy requirement per unit of body weight than their large and giant breed counterparts. In addition, they have relatively small stomachs so their ability to consume food is somewhat limited. This means that their diets should have higher energy content, be highly digestible and be more nutrient-dense than diets designed for larger breeds. Kibble size and shape should also be designed specifically for small mouths to aid in chewing and consumption.

The Medium Breeds

Small and large breeds have specific nutritional and health needs that are well documented but the medium breeds tend to have overlapping needs.

Medium breeds can have a moderately high energy need, depending on their lifestyle, which means they may benefit from nutrient-dense foods like the smaller breeds. Like large and giant breeds though, some medium breeds develop nutritionally-linked developmental bone problems, which means they might benefit from the diet recommendations outlined for them.

The Large and Giant Breeds

Large breeds are the ones who reach a mature body weight somewhere over 50 pounds. Large and giant breeds have a propensity for developmental bone problems, and research has shown that these problems can be responsive to nutritional management.

Research studies documented that improper feeding during growth is associated with several skeletal disorders in large breed dogs. Two nutritional scenarios are important in causing these disorders in puppies: 1) free-choice feeding of a diet with excess calories, and 2) supplementing calcium during the growth phase. The onset of bone developmental disorders is usually associated with rapid growth of the long bones. The most common of these disorders are canine hip dysplasia, osteochondrosis, and hypertrophic osteodystrophy.

Overfeeding

Feeding excess calories during the crucial growth phase of the puppy's life can create ill effects. Over supplying calories to a puppy can lead to a rapid, but unhealthy rate of growth. Not only does overfeeding lead to increased body mass, which can stress growing bones, but rapidly growing long bones can be inherently weaker than bones growing at normal rates.

Supplements

The mechanism for the effect of excess calcium is more complex. High dietary calcium leads to high-calcium levels in the blood that stimulate the body's natural mechanism to maintain a normal state. Through the hormone calcitonin, the normal maturing of cartilage is slowed and the rate at which bone resorbs calcium is retarded. Chronic suppression of these functions by excess calcium results in increased thickening of developing bone. This may, in turn, lead to developmental bone and joint problems.

**Large breed puppies, therefore, should receive adequate but not excessive dietary calcium. From a practical standpoint, a level of 0.8% dietary calcium is beneficial for large and giant breed puppies.** Generally speaking, a growing large breed dog is best supported by feeding a diet that contains approximately 26% protein (from high-quality, animal-based sources), 14% fat, 0.80% calcium, and 0.67% phosphorus. A reduced dietary energy density, relative to typical growth food, provides for easier management of growth rate and results in a moderately slowed growth rate relative to the genetic potential for growth. This will result in the same ultimate mature body size and a skeletal structure that is better able to support the increasing body mass as growth progresses.

***Does my dog need a grain-free diet?***

Let’s start with this: whole grains contribute valuable nutrients including vitamins, minerals, essential fatty acids and fiber to diets while helping to keep the fat and calories lower than if animal products were used in their place. Grain-free diets are devoid of wheat, rice, corn, millet, barley and oats.  Note grain-free does not mean low carb. Alternative carbohydrate sources for grain-free diets would come from starchy vegetables like potatoes, sweet potatoes, pumpkin and carrots. Maintaining an appropriate amount of carbohydrate in your pet’s diet is important. It’s only the source that is in question.

Grain-free diets can be particularly useful for some people which is why they are being considered for pets. They can provide relief for people with Crohn's disease or other digestive diseases and some people feel they can provide other health benefits as well.

The vast majority of dogs and cats are very efficient at digesting and utilizing nutrients from grains, however a small population of pets is allergic to specific grains. Animals with allergies to animal proteins or dairy may have grain-specific allergies as well.

The impact of refined grains on human nutrition and pet nutrition is a much bigger topic. There is still much to learn, evaluate and prove in both human and animal nutrition in these areas. We have seen people and animals thrive and fail on diets including refined grains so clearly more information is needed to help all of us make informed decisions.

***What are my options for Raw foods? Should I feed a Raw Food Diet?***

Raw diets come in the following formulations:

1) Home prepared raw food diets - Many recipes for homemade raw food diets are available in books, articles and on the Internet. These diets expect the owner to balance the diets out in the long term as each meal is not in itself balanced.

2) Commercially available raw (usually sold frozen). These diets are intended to be complete and balanced – but you must check the label- without the need for additional supplements.

3) A combination diet whereby "premix" - commercially available mixes of grains and supplements - can be bought to be mixed with a raw meat.

We certainly do not condemn anyone for choosing to feed raw, however at this time we do not recommend feeding raw foods to dogs. The reasons are because **nutritional inadequacy, infectious diseases** and **foreign body (i.e., bone) ingestion** are real concerns when dealing with these foods.

Commercially available raw foods are regulated just like any other pet food, by state laws, AAFCO, and the FDA. If feeding raw is important to you, then I suggest only feeding foods having undergone AAFCO feeding trials - a statement will be on the food bag label just as it is for commercial non-raw foods. This will ensure the food has been tested for nutrient loss due to processing and digestibility over time. If you are adamant about feeding a homemade diet then the best advice I can provide is to consult a board certified Veterinary Nutritionist to ensure your diet is balanced and appropriate for your pet. All of these suggestions will help address the concerns of nutritional inadequacy which comes up often with raw food diets.

Here's a look at the other issues with feeding raw foods:

As with any raw meat, there is the potential for contamination of raw meat-based pet foods. *Salmonella* spp has gathered the greatest attention as a possible risk; however *Campylobacter*, *Clostridium difficile*, *C. perfringens, C. botulinum, E. coli, Yersinia enterocolitica, Listeria monocytogenes* and enterotoxigenic *Staphylococcus aureus* are also of concern. Both pets and people are susceptible to infection from direct handling, ingesting or exposure to a contaminated environment. The latter occurs because pets that eat contaminated raw diets have been demonstrated to shed viable pathologic organisms in their feces and it is likely that areas that they frequent are also contaminated. Also remember, freezing does notkill bacteria; most of the bacteria found in raw meat diets can easily survive freezing.

Bones, whether raw or cooked, can fracture dogs' teeth. Bone also can block or tear the esophagus, stomach, or intestines. Bones are simply not recommended for dogs because they are an avoidable hazard.