

## **Nutrition - General Feeding Guidelines for Dogs**

Perhaps the most common question pet owners ask their veterinarian is “What should I feed my dog?” Feeding your dog an appropriate amount of a well-balanced diet is vital to its overall health and well-being. To understand how and what to feed your dog, you need to understand what the nutritional requirements of the dog are and how these requirements have developed through the process of biological evolution.

### **Since dogs are carnivores, doesn't this mean that they need to eat a diet that is meat based?**

As a species, the dog is a member of the scientific order Carnivora, a large group of mammalian animals that share a similar tooth structure. The dietary needs of animals belonging to this order vary. Some members of this group have an absolute requirement for meat in their diet (called obligate or true carnivores), while others can meet their nutrient requirements through eating plant material (herbivores) or a combination of meat and plants (omnivores). Cats are an example of an obligate carnivore, cows are an example of an herbivore, and dogs and humans are two examples of omnivores.

Because of the dietary needs of dogs, both their tooth structure and intestinal tract have become adapted to an omnivorous diet. This means that, under normal circumstances, dogs can meet their nutritional needs by eating a combination of plant and animal foods. The source of the proteins and fats is less important than the quality and digestibility of these essential components of the dog's diet. Dogs can thrive if they are fed a properly balanced vegetarian diet. However, an all-meat diet would be unbalanced and would not meet all of a dog's nutritional requirements.

As research into basic and applied nutrition has expanded our knowledge of canine nutrition, we now know that a well-balanced diet must also include an appropriate amount of minerals, vitamins, certain essential amino acids (from proteins), and specific essential fatty acids (from fats). These components are needed to build and maintain tissue and carry out biological reactions, and the necessary amounts vary somewhat with the dog's stage of life (puppy, adolescent, adult, pregnancy, senior).

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### **I was told that dogs cannot digest carbohydrates. Is this true?**

To meet their energy needs, dogs have evolved to use proteins and fats as their primary energy sources, but they can also use carbohydrates for energy. The fact that the dog's digestive system produces enzymes that are specific for digesting starches and sugars shows that they are capable of digesting carbohydrates. However, complex carbohydrates such as grains are more digestible when they are cooked.

## **I have heard that dogs should only eat raw foods and that dogs cannot properly digest cooked foods. Is this true?**

Domesticated dogs have adapted over millennia to consumption of diets provided by their human companions, including foods that have been cooked. As mentioned above, dogs can actually digest complex carbohydrates more easily once they have been cooked.

## **What are the nutritional requirements for dogs?**

The six basic nutrients are water, proteins, fats, carbohydrates, minerals, and vitamins. These essential nutrients are required as part of the dog's regular diet and are involved in all of the basic functions of the body. The minimum dietary requirement has been established for many nutrients. The maximum tolerable amounts of some nutrients are known, and results of toxicity have been established. What is less understood is what may happen over time with marginal deficiencies or excesses.

Nutritional guidelines have been developed by the Association of American Feed Control Officials (AAFCO). AAFCO guidelines are the general basis for the nutritional content of commercial pet foods. Here are some key nutritional guidelines from the 2009 AAFCO guide:

<b>Nutrient</b>	<b>Growth and Reproduction</b>	<b>Adult Maintenance Minimum</b>	<b>Adult Maintenance Maximum</b>
Crude protein	22%	18%	
Crude fat	8%	5%	
Linoleic acid	1.0%	1.0%	
Calcium	1%	0.6%	2.5%
Phosphorus	0.8%	0.5%	1.6%
Potassium	0.6%	0.6%	
Sodium	0.3%	0.06%	
Copper	7.3 mg/kg	7.3 mg/kg	250 mg/kg
Zinc	120 mg/kg	120 mg/kg	1,000 mg/kg
Vitamin A	5,000 IU/kg	5,000 IU/kg	250,000 IU/kg
Vitamin D	500 IU/kg	500 IU/kg	5,000 IU/kg
Vitamin E	50 IU/kg	50 IU/kg	1,000 IU/kg
Thiamine	1.0 mg/kg	1.0 mg/kg	

Keep in mind that these are only guidelines; your dog may need more or less based on its individual needs and health status.

## **What should I look for in a dog food?**

The best advice you can receive about feeding your dog is this: Feed your dog the highest-quality food you can afford. The differences between a premium food and budget food aren't found on the nutrition label; they're found in the quality and source of ingredients. Two dog foods may each contain 27% protein but be vastly different when it comes to digestibility.

Pet food ingredients are listed by order of weight. Each ingredient is weighed when it is added to the batch of food, and ingredients such as fresh meat contain a lot of water, much of which is lost during processing. This means that a dry diet that lists corn as the first ingredient may be nutritionally superior to one listing meat first.

Select diets with real, recognizable, whole-food ingredients.

To further complicate matters, some nutrients are listed as a “minimum” percentage, while others are listed as a “maximum” percentage, meaning that the batch of food may contain a higher or lower percentage of the ingredient than shown on the label.

The best method to choose a food for your dog is to ask your veterinarian. However, here are some general tips to help you decide what should go into your dog's food bowl:

1. Select diets with real, recognizable, whole-food ingredients. If the majority of listed ingredients is unfamiliar to you, find another diet.
2. Select a low-calorie diet. Most adult, indoor, spayed or neutered dogs have low energy requirements. Your dog's diet should contain a relatively small amount of calories per cup—ideally less than 350 calories. If your dog food contains 500 calories per cup and you have a 20-pound dog, the amount you should feed is tiny (and unsatisfying!). Making matters worse, high-calorie foods mean even a few extra kibbles can really pack on the pounds.

## **How much should I feed?**

The ideal method for determining how many calories to feed your dog is to determine what your dog's lean weight should be and feed according to that weight. Unfortunately, this requires constant monitoring (and weighing) and is not always practical.

Your veterinarian can estimate how many calories your dog needs each day based on its lifestyle and body condition score. The standard formula used for calculating the energy requirements of the average adult dog that lives in the house, receives light daily exercise, and is spayed or neutered is:

$30 \times \text{Weight in Kg (or pounds divided by 2.2)} + 70 = \text{Daily caloric needs}$

Be aware that few of our dogs are “average,” so this formula is merely a starting point. Most dogs will require fewer calories on a daily basis, while a few will require slightly more. This daily caloric total includes not only your dog's meals, but also any snacks and

treats. If your dog needs to lose weight, your veterinarian will recommend caloric restriction (which is usually 70% to 90% of the calculated amount for weight maintenance).

Be sure to count snacks and treats as part of your dog's total daily calories.

### **How often should I feed my dog?**

The biological evolution of dogs as hunters has given them specialized digestive and gastrointestinal adaptations that allow them to ingest a large meal followed by up to days of not eating. However, for most pet dogs, feeding once or twice per day is recommended. Many dogs will benefit from eating equally divided meals two to three times per day. Regardless of the feeding schedule you choose, avoid allowing your dog to exercise vigorously after consuming a large meal, especially if your dog eats its food rapidly. This will help minimize problems with bloat, intestinal obstruction, or other serious digestive disorders.

Be sure your dog has access to fresh, clean water at all times.

### **Is dry or canned food better?**

In terms of nutrition and digestibility, there are simply no differences between dry and canned (wet) dog food. You should make your decision based on your lifestyle, preferences, and budget. For dogs that need to consume more water or have certain special dietary needs, canned foods may be a better choice. Otherwise, most dogs will do fine on dry kibble.

Some dry kibble has been specially formulated as dental diets and can mechanically help remove plaque. For further information, see our handout "Dental Disease in Dogs".

### **Are there any breed differences in nutritional requirements?**

In the past several decades, nutritionists and veterinary researchers have identified that there are definite breed variations in metabolism and nutrient requirements. Breeds of dogs that were developed in specific locations, such as Arctic Circle breeds and some of the "water" breeds, may have adapted to specialized diets that are common in their place of origin. Inbreeding and genetic differences between individuals in each species may result in further need for individualization of the pet's diet in order to optimize health.

In addition to considering your dog's breed, you should also consider your dog's lifestyle. Working pets (hunting dogs, field trial dogs, herding dogs) require different ratios of proteins and fats in their diets than "lap dogs" or sedentary house pets.

### **What is meant by "life-stage nutrition"?**



Dogs have varying nutritional needs during different stages of their lives, and feeding a diet that is formulated for all

life stages is not necessarily appropriate. An “all-purpose” dog food may not provide enough nutrients to meet the needs of a growing puppy or a pregnant or nursing mother. Conversely, this same all-purpose diet may provide excessive nutrients to a senior or inactive dog. Feeding your dog according to its stage of life (puppy, adolescent, pregnancy, adult, senior) is now recommended by respected nutritionists to maintain your pet’s overall health and well-being and improve both the quality and the quantity of your dog’s life.

### **Life-stage feeding for puppies**

Early in life, puppies must eat often and lots! They need relatively larger quantities of food because they are growing rapidly and have limited space in their tiny stomachs.

At 6 to 8 weeks of age, they need to be fed about four to six meals a day.

By 6 months, the need for food is decreased because puppies are about 75% of their adult size and can be fed two to three meals a day.

A good-quality puppy food has advantages over adult dog food because it has been specially formulated for a puppy’s demanding nutritional requirements and contains the appropriate amount of calcium. Because of their rapid growth, any nutritional “mistakes” made during puppyhood will have more severe, even irreversible and lifelong, consequences. Because growth is almost complete by 8 to 10 months of age, the average puppy can be switched to “adult” dog food at about 12 months of age.

If you have a large- or giant-breed puppy, one that is going to weigh more than 50 pounds (23 kg) as an adult, or is at-risk for hip dysplasia, elbow dysplasia, or other growth abnormalities (for example, Labrador and golden retrievers, German shepherds), you should feed a puppy food specially formulated for “large-breed” puppies. These diets are formulated to contain the optimal ratio of proteins and calcium to moderate rapid bone growth that can lead to joint disorders. Your veterinarian may also recommend a transitional “adolescent” diet for your pet’s “teenage” years.

After weaning, the majority of puppies lose the ability to digest milk sugar (lactose). Therefore, while small amounts may be tolerated, feeding milk can cause intestinal upset and diarrhea because dogs cannot digest it properly.

### **Life-stage feeding for the older dog**

Older dogs, especially those over 7 years of age, will benefit from a diet formulated for their needs. Senior dog diets often have lower calories, higher protein, lower sodium, and fewer carbohydrates. Many also contain ingredients such as prebiotics to maintain

healthy intestinal microbial populations, increased omega-3 fatty acids and other antioxidants to combat inflammation, and glucosamine to promote joint health. Be sure to ask your veterinarian about the best food for your senior dog.

### **What is my take-home message?**

Choosing a high-quality food from the hundreds of available brands and formulas can be challenging. The pet nutrition industry is very competitive, and most commercially available foods are very good balanced diets. As your veterinary health-care providers, we can help you select a diet that is backed by scientific principles and research and that meets your pet's individual needs.

If you have any questions about a particular food, your best source for help is your veterinary hospital.

This client information sheet is based on material written by: Cheryl Yuill, DVM, MSc, CVH

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