



## CANINE NUTRITION

Nutrition forms a basic part of all life. From plants to animals to people, each of us has very specific nutritional needs in order to live long, healthy and happy lives – your dog is no exception. Through the various stages of your dog's life, his nutritional needs will change. You should change your dog's diet according to age and special needs requirements. Here are some basic nutrients that are required regardless of their age:

### NUTRIENTS

Nutrients are substances obtained from food and used by an animal as a source of energy and as part of the metabolic machinery necessary for maintenance and growth. Barring any special needs, illness-related deficiencies or instructions from your vet, your pets should be able to get all the nutrients they need from high-quality commercial pet foods, which are formulated with these special standards in mind. If you would like to learn about what your pet's body needs, and why, here are the six essential classes of nutrients fundamental for healthy living:



- **Water** is the most important nutrient. Essential to life, water accounts for between 60 to 70 percent of an adult pet's body weight. While food may help meet some of your pet's water needs (dry food has up to 10 percent moisture, while canned food has up to 78 percent moisture), pets need to have fresh clean water available to them at all times. A deficiency of water may have serious repercussions for pets: a 10-percent decrease in body water can cause serious illness, while a 15-percent loss can result in death.
- **Proteins** are the basic building blocks for cells, tissues, organs, enzymes, hormones and antibodies, and are essential for growth, maintenance, reproduction and repair. Proteins can be obtained from a number of sources. Animal-based proteins such as chicken, lamb, turkey, beef, fish and egg have complete amino acid profiles. (Please note: Do not give your pet raw eggs. Raw egg white contains avidin, an anti-vitamin that interferes with the metabolism of fats, glucose, amino acids and energy.) Protein is also found in vegetables, cereals and soy, but these are considered incomplete proteins.
- **Amino acids** are the building blocks of proteins, and are divided into essential and non-essential amino acids.
  - Essential amino acids cannot be synthesized by the animal in sufficient quantities and **MUST** be supplied in the diet. Essential amino acids include arginine, methionine, histidine, phenylalanine, isoleucine, threonine, leucine, tryptophan, lysine, and valine.
  - Non-essential amino acids can be synthesized by your pet and are not needed in the diet.
- **Fats** are the most concentrated form of food energy, providing your pet with more than twice the energy of proteins or carbohydrates. Fats are essential in the structure of cells and are needed for the production of some hormones. They are required for absorption and utilization of fat-soluble vitamins. Fats provide the body insulation and protection for internal organs. Essential fatty acids must be provided in a pet's diet because they cannot be synthesized by a dog in sufficient amounts. A deficiency of essential fatty acids may result in reduced growth or increased skin problems. Linoleic acid is an essential fatty acid for dogs.
- Omega-6 and omega-3 fatty acids play a vital role in healing inflammation. Replacing some omega-6 with omega-3 fatty acids can lessen an inflammatory reaction—whether it is in the skin (due to allergies), the joints (from arthritis), the intestines (from inflammatory bowel disease) or even in the kidneys (from progressive renal failure). The optimal ratio of omega-6 to omega-3 fatty acids for dogs is between 5 and 10 to 1.

**Please note:** It is impossible to accurately determine the fatty acid ratio of a diet if the owner prepares home-cooked foods. If a dog is to benefit from the effects of these fatty acid ratios, he must be fed a fixed-formula food that guarantees these ratios.

- **Carbohydrates** provide energy for the body's tissues, play a vital role in the health of the intestine, and are likely to be important for reproduction. While there is no minimum carbohydrate requirement, there is a minimum glucose requirement necessary to supply energy to critical organs (i.e. the brain). Fibers are kinds of carbohydrates that modify the mix of the bacterial population in the small intestine, which can help manage chronic diarrhea. For dogs to obtain the most benefit from fiber, the fiber source must be moderately fermentable. Fiber sources that have low fermentability (e.g. cellulose) result in poor development and less surface area of the intestinal mucosa. Highly fermentable fibers can produce gases and by-products that can lead to flatulence and excess mucus. Moderately fermentable fibers—including beet pulp, which is commonly used in both dog foods—are best, as they promote a healthy gut while avoiding the undesirable side effects. Other examples of moderately fermentable fibers include brans (corn, rice and wheat) and wheat middlings. Foods that are high in fiber are not good for dogs with high energy requirements, such as those who are young and growing.
- **Vitamins** are catalysts for enzyme reactions. Tiny amounts of vitamins are essential to dogs for normal metabolic functioning. Most vitamins cannot be synthesized in the body, and therefore are essential in the diet.  
-When feeding a complete and balanced diet, it is unnecessary to give a vitamin supplement unless a specific vitamin deficiency is diagnosed by a veterinarian. Due to the practice of over supplementation, hypervitaminosis—poisoning due to excess vitamins—is more common these days than hypovitaminosis, or vitamin deficiency! Excess vitamin A may result in bone and joint pain, brittle bones and dry skin. Excess vitamin D may result in very dense bones, soft tissue calcification and joint calcification.
- **Minerals** are inorganic compounds that are not metabolized and yield no energy. These nutrients cannot be synthesized by animals and must be provided in the diet. In general, minerals are most important as structural constituents of bones and teeth, for maintaining fluid balance and for their involvement in many metabolic reactions.

## CHOOSING THE RIGHT DOG FOOD



There are many good-quality dog foods for sale; read the labels and talk with your veterinarian if you need help deciding what to feed your dog. Many people only feed their dog dry food, since it's more convenient to serve, has less odor, is less likely to spoil in the bowl, and can reduce the buildup of tartar on the dog's teeth.

There are also many nutritionally complete wet dog foods for sale. Many people use wet food as a treat, as a way to hide daily medications, or as a way to increase water intake (sometimes this is medically indicated). Any wet food remaining uneaten after 20 minutes should be thrown away. **Remember to have fresh, cool water available for your dog at all times.**

## THINGS TO AVOID FEEDING YOUR DOG

You should avoid the following:

- Alcoholic beverages (they can cause coma and even death)
- Cat food (it's generally too high in protein and fats)
- Caffeine (it can be toxic, and adversely affect the heart and nervous system)
- Chocolate (in large amounts, chocolate can also be toxic)
- Fat trimmings (they can cause pancreatitis)
- Raisins and grapes (they can damage the kidneys)

- Nicotine (it affects the digestive and nervous systems, and can result in rapid heartbeat, collapse, coma and death)
- Table scraps (they are not nutritionally balanced)

Excess salt, sugar and fats can cause obesity, dental problems and finicky eating in your dog. For a happy dog, feed him a healthy diet and get plenty of exercise together.

### Switching your Dogs diet

Sometimes, skin problems, ear infections and digestive problems are signs of food allergies. Discuss with your veterinarian whether a diet change is indicated.

Some medical conditions, such kidney disease or diabetes, require special diets.

Most older dogs need to be fed "senior" dog food. Extra-large breeds and some mixes age faster than other breeds. Ask your veterinarian when your dog should begin eating a senior diet.

If you have any questions or concerns, discuss your dog's diet with your veterinarian during regular checkups. If you plan to change your dog's diet, do it gradually. Start by mixing 25 percent of the new food with 75 percent of the old food. Slowly increase the amount of new food over the course of three days until you are feeding her all new food. Some dogs try to pick out just the old familiar food to eat, but don't worry: one small or missed meal will not hurt a healthy dog. While you're making the change, don't offer your dog other foods, treats or table scraps, or you may be promoting finicky eating behavior.

### FEEDING YOUR PUPPY

- Newborn puppies receive complete nutrition from their mother's milk for the first four weeks of life. Mom's milk is 100 percent perfect for their needs, so there is no need to feed them anything else.
- In the event that the mother dog is ill or doesn't produce enough milk—or if the pups are found as orphans—it may be necessary to feed a commercial milk replacer. If you find yourself in this situation, contact your veterinarian for product and feeding recommendations.
- Puppies generally begin eating puppy food around three or four weeks of age. Start with small quantities, and gradually increase the amount of puppy food - they need three or four small fresh meals offered throughout the day.
- Puppies often play with their food when it is first introduced, but they will quickly learn what to do with it! By the time the pups are completely weaned at seven to eight weeks old, they should be eating their dry food consistently.
- Puppies require up to twice the energy intake of adults and, depending on the breed, will need to be fed a food that contains 25- to 30-percent protein.
- Small breeds of dogs—those weigh 20 pounds or less at maturity—reach mature body weight in nine to twelve months. As puppies, they can be fed free-choice. When food is readily available, most small-breed dogs will develop good eating habits and not become overweight. However, if you have other pets, you should probably feed your small-breed dog by the portion control method.
- Most medium-breed puppies (adult size between 20 and 50 pounds) and all large- or giant-breed pups (more than 50 pounds as adults) are best fed with the portion-control method.



- If they are allowed to overeat, they can consume too many calories, grow too rapidly and develop bone growth problems. Clinical signs often seen with bone growth disease include bowing of the front legs. Sometimes, these signs are misdiagnosed as calcium deficiency (also known as rickets). Radiographs are crucial for an accurate diagnosis.
- At six months, puppies can go down to two meals per day. If your puppy is going to grow to be a large dog, he may benefit from an attempt to slow his growth through diet change. Ask your veterinarian when you should transition from puppy to adult food.
- Do not overfeed in an attempt to accelerate a puppy's growth rate. Remember, the adult size of a dog is determined genetically—not by how fast the animal grows. Controlled feeding of a balanced diet specifically made for large- and giant-breed puppies facilitates optimal skeletal development. It is important to aim for a slower rate of growth with large and giant breed puppies.
- It is okay to feed your puppy treats. However, treats should make up no more than five percent of your puppy's daily nutrient intake. The rest of his or her diet should come from a high-quality puppy food.

## FEEDING YOUR ADULT DOG

Adult dogs require sufficient nutrients to meet energy needs and to maintain and repair body tissues. The amount you feed your adult dog should be based on his or her size and energy output. Activity levels vary dramatically between pets, and will play an important role in determining caloric intake.

- We recommend all dogs be fed twice daily. Simply divide the amount suggested on the label of your pet's food into two meals, spaced eight to twelve hours apart. You may need to adjust portions as you learn your dog's ideal daily "maintenance" amount.

Pet owners should always consult with their dog's veterinarian to determine the best feeding schedule and types of foods for their pets.

- We all love to give our dogs treats. However, treats should be given in moderation and should represent five percent or less of the dog's daily food intake. The rest should come from a nutritionally complete dog food. When using treats frequently, such as during training exercises, try to use the smallest pieces you can.

## Feeding Methods

Dogs may be fed successfully in a number of ways that meet both the owner's and the animal's needs and circumstances. These methods include portion-control feeding, free-choice feeding and timed feeding.

- **Portion-control feeding** entails measuring your pet's food and offering it as a meal, thereby controlling the amount of food that can be consumed. This method is used for weight control programs and for animals that might overeat if fed free-choice. Food can be provided in one or more meals daily.
- **Free-choice feeding** is also known as "ad lib" feeding or "free feeding." Food is available at all times, as much as the pet wants, whenever the pet wants. Most nursing mothers are fed by the free-choice method. This method is most appropriate when feeding dry food, which will not spoil if left out. Some dogs will overeat when fed free-choice method, which can result in obesity. If your pet eats free-choice and has put on too much weight, you will need to switch to portion-control feeding.



- **Timed feeding** involves making a portion of food available for the pet to eat for a specified period of time. For example, the food can be placed in the dog's bowl for thirty minutes. After that time, if the pet has not consumed the food, it is removed.

**Appetite.** To know whether your dog's appetite is normal, supervise your dog while she's eating. If you have more than one dog, supervising their mealtimes will ensure that the dogs do not eat each other's portions or the wrong food.

**Overeating.** As a responsible dog owner, one of the most common pitfalls you'll have to watch out for is overfeeding. Attempts to shower our dogs with love by means of big meals and tons of tasty treats are sweet, but misguided. In dogs, as with humans, extra weight can lead to health problems.

**Be sure to indulge your four-legged friend with affection, not food.**

If a dog eats too much or too fast, or exercises too soon after a meal, he can get bloating or GDV (gastric dilatation and volvulus). Deep-chested breeds are at higher risk, but if any dog shows discomfort after eating or has a visibly bloated abdomen, seek medical attention right away. GDV is very painful and will be fatal if left untreated.

Should you change your dog's diet over the course of his or her life?

Know what a good weight is for your dog and watch his weight as he gets older. If your dog does not have a visible waistline, have your veterinarian take a look at him. There may be a medical cause for his weight gain, or you may need to give him more exercise and switch to a "light" dog food.

**Training & Reinforcement.** You can use mealtime to reinforce your role as the leader. By doling out food at mealtimes, you are seen as the hunter, an important and powerful figure. Asking the dogs to sit before their bowls are given to them helps to reinforce the idea that living in a human home has behavior requirements.

## FEEDING OLDER DOGS

Dogs begin to show visible age-related changes at about seven to twelve years of age. There are metabolic, immunologic and body composition changes, too. Some of these are unavoidable. Others can be managed with diet:

- Older dogs have been shown to progressively put on body fat in spite of consuming fewer calories. This change in body composition is inevitable and may be aggravated by either reduced energy expenditure or a change in metabolic rate. Either way, it is important to feed a diet with a lower caloric density to avoid weight gain, but with a normal protein level to help maintain muscle mass.
- Avoid "senior" diets that have reduced levels of protein. Studies have shown that the protein requirement for older dogs does not decrease with age, and that protein levels do not contribute to the development or progression of renal failure. It is important to feed older dogs diets that contain optimum levels of highly digestible protein to help maintain good muscle mass.
- Talk to your veterinarian about increasing your senior dogs GLA intake. Gamma-linolenic acid (GLA) is an omega-6 fatty acid that plays a role in the maintenance of healthy skin and coat. Although it is normally produced in a dog's liver, GLA levels may be diminished in older dogs. Does your older dog's diet contain GLA?
- Aging can affect a dog's intestinal bacteria, which can result in symptoms of gastrointestinal disease. Senior diets for dogs should contain FOS (fructooligosaccharides) to promote the growth of beneficial bacteria.



- Antioxidants such as vitamin E and beta-carotene help eliminate free radical particles that can damage body tissues and cause signs of aging. Senior diets for dogs should contain higher levels of these antioxidant compounds. Antioxidants can also increase the effectiveness of the immune system in senior dogs.
- Routine care for geriatric pets should involve a consistent daily routine and periodic veterinary examinations to assess the presence or progress of chronic disease. Stressful situations and abrupt changes in daily routines should be avoided. If a drastic change must be made to an older pet's routine, try to minimize stress and to realize the change in a gradual manner.

### **When is it time to switch to a senior diet?**

Since smaller dogs live longer and don't experience age-related changes as early as bigger dogs, size is used to determine when it's time to feed your canine a senior diet:

Small breeds/dogs weighing less than 20 pounds—7 years of age

Medium breeds/dogs weighing 21 to 50 pounds—7 years of age

Large breeds/dogs weighing 51 to 90 pounds—6 years of age

Giant breeds/dogs weighing 91 pounds or more—5 years of age

The main objectives in the feeding an older dog should be to maintain health and optimum body weight, slow or prevent the development of chronic disease, and minimize or improve clinical signs of diseases that may already be present.

### **OVERWEIGHT DOGS**

Obesity is an extremely common problem in pets and, as with humans, can be detrimental to the health of a dog. The overweight pet has many added stresses upon his body and is at an increased risk of diabetes, liver problems and joint pain.

Obesity develops when energy intake exceeds energy requirements. The excess energy is then stored as fat. Once a pet is obese, he may remain obese even after excessive caloric intake stops. The majority of cases of obesity are related to simple overfeeding coupled with lack of exercise.

Certain groups of dogs appear more prone to obesity than others. Specific breeds (Labrador retrievers and pugs, for example) and older dogs are particularly prone.

**Assessing obesity.** As a subjective assessment of body condition, you should be able to feel the backbone and palpate the ribs in an animal of healthy weight. If you cannot feel your pet's ribs without pressing, there is too much fat.

Also, you should see a noticeable "waist" between the back of the rib cage and the hips when looking at your pet from above. Viewed from the side, there should be a "tuck" in the tummy—the abdomen should go up from the bottom of the rib cage to inside the thighs. Dogs who fail these simple tests may be overweight.

### **Weight loss programs for dogs**

We recommend that you consult your pet's vet before starting on a weight loss program, which should include these major areas:

#### **Correct Diet**

Overweight animals consume more calories than they require. Work with your veterinarian to determine your pet's caloric requirements, select a suitable food and calculate how much to feed. The diet should contain a normal level of a moderately fermentable fiber and the type of fat that prevents the skin and coat from deteriorating during weight loss. Diets that dilute calories with high fiber lead to increased stool volumes, frequent urges to defecate and variable

decreases in nutrient digestibility.

**Exercise.** Increasing physical activity can be a valuable contributor to both weight loss and maintenance. Regular exercise burns more calories, reduces appetite, changes body composition and will increase your pet's resting metabolic rate.

### **Owner Behavior Modification**

A successful weight management program requires permanent changes in the behaviors that have allowed the pet to become overweight. Perhaps you are giving your pet too many treats, for example, or not giving him enough opportunities to exercise.

### **Your commitment**

Here are some important things you can do to help your dog lose weight:

- Remove the pet from the room when the family eats.
- Feed your pet several small meals throughout the day.
- Feed all meals and treats in the pet's bowl only.
- Reduce snacks or treats.
- Provide non-food related attention.

