Nutrients in Pet Foods FAQs

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- Carbohydrates
- Fats
- Minerals
- Protein and Amino Acids
- Metabolizable Energy
- Fiber

Carbohydrates

What role do carbohydrates play in pet food?
Carbohydrates serve as an energy source, and as a source of dietary fiber.

Most commercial dry dog foods contain between 30% and 70% carbohydrates; cat foods usually have a lower level than dog foods. If we examine the diets of the wild canines and felines that most closely resemble our domestic pets, we recognize that the wild relatives do eat some carbohydrates through the consumption of the intestinal contents of their prey. However, it would rarely constitute even 10% of their diet. Your dog can consume large quantities of protein and then convert that protein into energy and muscle. He can also convert many carbohydrate sources into the same kind of energy. This ability to use both carbohydrates and proteins as an energy source explains how we can feed dogs a high carbohydrate diet, particularly when we feed processed carbohydrates dogs can easily digest. So, essentially we meet the dog's protein requirement with meat, and then meet their energy and fiber requirements with carbohydrates instead of the protein they would often use in the wild.

Cats are different. As obligate carnivores, they depend on high amounts of animal protein and fat in their diet. As with dogs, they use protein to build muscle, blood cells, etc. but they also use it for energy. Cats also use fats as a primary source of energy. They are not able to use carbohydrates as well. This is one reason why you will see much lower levels of carbohydrates and higher levels of protein and fat in cat foods.

Carbohydrates are essential in the formation of dry pet food. The starchy carbohydrates add structure, texture, and form to kibbled food helping to create a product that is stable and easy to feed. Canned foods could be manufactured without the addition of carbohydrates, but dry kibble could not exist in its current form without them.

How do you calculate the amount of carbohydrate in a pet food?
The carbohydrate percentage can be roughly calculated by subtracting the sum of the percentages of protein, fat, fiber, ash (generally about 6.5%) and moisture from 100%. For example, a dry cat food with crude protein of 34%, crude fat of 20%, crude fiber of 3%, ash of 6.5%, and moisture of 10% would have a carbohydrate content of 26.5% i.e., 100 - (34 + 20 + 3 + 6.5 +10) = 26.5%.

What are soluble carbohydrates?
Soluble carbohydrates are the starchy portion of a plant that can be broken down in the digestive tract. Soluble carbohydrates are found in high concentrations in cereal grains such as rice, wheat, corn, barley, and oats. Your pet can easily digest the cooked or extruded forms of soluble carbohydrates found in most pet foods. However, pets cannot easily digest all forms of starch, such as those found in raw cereal grains. Cats are less able to efficiently digest carbohydrates.

Can carbohydrates cause health problems?
Carbohydrates can occasionally cause medical problems including obesity in dogs and cats. Obesity occurs when your pet's energy needs are exceeded and the extra glucose created by the digestion of the carbohydrates is stored as fat. Realize that an excess of carbohydrates, fats, or proteins can all lead to obesity, but carbohydrates are usually the cause since they are typically the most common energy source and are easily converted to glucose.

In addition to obesity, high levels of carbohydrates in cat foods may influence the development of certain conditions in cats, such as diabetes mellitus (sugar diabetes).

Maldigestion may also occur in some animals on high carbohydrate diets. This condition can result from deficiencies of the natural enzymes necessary to break down carbohydrates, can range from mild to severe and often includes excessive gas, bloating, and diarrhea.
[Back to Top]

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Fats

Does my pet need fat in his diet?
Fat is actually a very important nutritional requirement in animal diets. Fat supplies energy, contributes to palatability, influences the texture of foods, carries fat-soluble vitamins and provides fatty acids. The type and quantity of fats in the diet are extremely important since they can influence appetite and food intake (and thus weight), the ability to perform muscular work, and haircoat condition.
[Back to Top]

Minerals

Do pet foods supply minerals?
Because minerals are essential to good health, pet foods include mineral supplements to meet the nutrient requirement standards developed by the Association of American Feed Control Officials (AAFCO). Minerals commonly added to pet food include: calcium, phosphorus, magnesium, potassium, sodium and chloride, iron, copper, manganese, zinc, iodine, and selenium.
[Back to Top]

Protein and Amino Acids

Why do pets need protein?
Proteins are necessary for all aspects of growth and development and are very important in structural makeup and the immune system. In addition, they are burned as calories and can be converted to and stored as fat. As a general rule, cats need more protein than dogs.

Dogs and cats actually require a number of amino acids (the building blocks that make up proteins). Some of these they can make within their bodies; others they must have in their diet. Different protein sources provide different levels of the various amino acids, so that is one of the reasons you may find there are several protein sources within a food.

Why do cats require a higher level of protein than dogs?
Cat's are obligate carnivores, meaning they must have meat in their diet, and their metabolism is different than a dog's and most other mammals. They use protein for energy even when carbohydrates and fats are present in the diet, so they require more protein than other species.

What is taurine, and why does my cat need it?
Taurine is an amino acid which is necessary for proper bile formation, eye health, and proper function of the heart. Cats require a high amount of taurine for their body functions, yet have limited enzymes which can produce taurine from other amino acids such as methionine and cysteine. Therefore, they need a diet high in taurine. If taurine is deficient, signs such as a heart condition called dilated cardiomyopathy, retinal degeneration, reproductive failure, and abnormal kitten development can occur.

What is arginine, and why does my cat need it?
Arginine is an amino acid. Most animals manufacture the amino acid ornithine through various processes, some of which require arginine. In cats, the only method to produce ornithine is to convert it from arginine. Ornithine is necessary because it binds ammonia produced from the breakdown of protein. If cats are deficient in arginine, there will not be enough ornithine to bind the ammonia, and severe signs such as salivation, vocalization, ataxia, and even death can result from the high ammonia levels. These signs often occur several hours after a meal, when most of the ammonia is produced.

Does a high protein percentage (as shown on the package) mean that a pet food is automatically better than others with lower percentages?
Many people make the mistake of judging the quality of a pet food simply by looking at the percentage of protein shown on the label. This is not the best way to judge overall quality for several reasons:

- Not all protein is created equal.
- Higher protein percentages do not automatically mean higher quality food - the right level of protein for your particular pet is what matters.
- Other nutrients levels are necessary for overall health and the proper use of protein by the body.

A higher percentage of protein doesn't mean that a pet food is automatically better than others with a lower percentage. Similarly, a lower protein percentage isn't automatically bad, provided that the protein included in the food comes from a good source (such as real chicken or real lamb meat). Don't rely solely on the percentage of crude protein shown in the guaranteed analysis on the package. While it is tempting to assume that a high percentage of protein means that a food contains a lot of beneficial protein (and is therefore better than comparable foods), this is not always the case. Always evaluate the source of the protein - not just the amount - when considering/comparing pet foods. The calorie content, amount of fat and fiber, and the presence of fatty acids and antioxidant nutrients should also be taken into account.

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Can I tell which proteins are better than others?
Not all proteins are created equal, and some are better for pets than others. Every protein source contains different levels of amino acids and each protein is different in its ability to be broken down into amino acids. The ability of a protein to be used by the body and its amount of usable amino acids is termed biological value. Egg has the highest biological value and sets the standard by which other proteins are judged. Egg has a biological value of 94. Fish meal and milk are close behind with a value of 92. Beef is around 78 and soybean meal is 67. Meat and bone meal and wheat are around 50 and corn is 45. Things like hair and feathers would be very high in protein but would be down at the bottom of the list for biological value because they are fairly indigestible.

How much protein does my pet need?
Protein requirements vary from species to species and can vary greatly. Cats require more protein than dogs. That is one reason cats should not be fed dog food. During the rapid growth stages puppies and kittens have higher protein requirements than adults. Pregnant and lactating animals also need more. In addition, activity plays a role - performance dogs, for instance, have higher requirements than the average dog. Sick, weak, and debilitated animals also need extra protein. Animals with kidney disease may need to be on a protein-restricted diet to lessen the effects of the kidney disease. Look for a food that provides the optimum level of protein for your pet's particular life stage and activity. Otherwise, you'll feed your pet excess protein that will simply be converted into fat. If in doubt, ask your veterinarian for advice.

Can I feed my pet too much protein?
If your pet eats too much protein, some will be excreted in the urine and the rest will be used as calories or converted to fat. However, if your pet has a kidney problem, high protein diets are not recommended. Most pet food companies slightly exceed the minimum recommended protein requirements to ensure that pets get adequate protein from their food.

How can I tell if my food has enough protein?
Generally, purchasing a reputable, quality brand of pet food that fits your pet's activity level will be just fine. However if your pet has special protein needs, or you want to find the best possible food for your budget, then you must interpret the often-confusing label.

Keep in mind that the protein level shown on the bag or can does not indicate the percentage of digestible protein, just the overall protein content. In quality foods, digestibility is between 70 and 80%. In lesser-quality foods, the digestibility could drop to 60% or less. To roughly determine the amount of digestible protein, read the ingredients and note the order in which they appear. Ingredients are listed in order of weight. Chicken and lamb are very digestible, and if they are listed as the first ingredients on the label, you can assume the food is a good quality protein source. If the first ingredient is chicken by-product or other meat by-products (which are lower in digestibility), the food is an acceptable protein source. Remember, grains do not provide as much digestible protein and contribute heavily toward the carbohydrate load. It is a good idea to follow this general rule: try to find a food in the upper to middle price range. And keep in mind the highest-priced foods are not necessarily the best foods, and the lowest-priced foods are not always of poor quality.

Does high protein cause kidney disease?
No. This myth probably started because, in the past, patients with kidney disease were commonly placed on low-protein (and thus low-nitrogen) diets. Today, we often put them on a diet that is not necessarily very low in protein, but instead contains protein that is more digestible (therefore producing fewer nitrogen by-products). These diet changes are made merely because damaged kidneys may not be able to handle the excess nitrogen efficiently. In pets with existing kidney problems, nitrogen can become too high in the bloodstream which can harm other tissues.

Unless your veterinarian has told you your pet has a kidney problem that is severe enough to adjust the protein intake, you can feed your pet a normal amount of protein without worrying about "damaging" or "stressing" your pet's kidneys. Also, keep in mind the fact that you are not "saving" your pet's kidneys by feeding a low-protein diet.

Is meat meal good for my pet?
In its simplest, purest form, meat meal is meat with the water and fat removed. The dried meat is then ground into small granules or powder for use in pet food. Pure meat meal, as opposed to meat and bone meal or meat by-product meal, is a good source of concentrated protein which is nutritionally excellent for your pet. Pure meat meal cannot contain blood, hair, hoof, horn, hide trimmings, manure, or stomach or rumen contents, except for amounts that may be unavoidably included during processing. It cannot contain any added extraneous materials, and may not contain any more than 12 percent indigestive materials. No more than 9 percent of the crude protein in the meal can be indigestible.
[Back to Top]

Metabolizable Energy

What is metabolizable energy (ME)?
Understanding metabolizable energy (ME) is essential in determining the nutritional quality of your pet's food. Especially important when considering/comparing pet foods, ME is defined as the amount of energy available from pet food once the energy is excreted through feces, urine, and combustible gases has been subtracted. Essentially, ME is the energy left for your pet's body to use once all digestion is complete.

To live a healthy, happy life, your pet needs a certain number of calories per day. ME, as shown on pet food packages, shows the amount of calories the food will provide your pet. Look on the package for a statement of calorie content, expressed as

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"ME (kcal/kg) = a number" (3481, for example). You should also see a number of calories per cup or per can, depending on whether the food is dry or canned.

ME per cup essentially equals the usable calories and their concentration/density. A higher ME number indicates a higher concentration of calories, and a more energy-packed food. Think of the difference between a sports energy bar and a rice cake. The energy bar has a much higher ME, because it contains concentrated calories for energy. Similar to an energy bar, pet foods with higher ME numbers (such as Drs. Foster & Smith pet foods) allow your pet's body more concentrated calories for more energy. Plus, your pet's body will use more of the food, eliminate less as waste, and give you less waste to clean up. Pet foods with a higher ME can also save you money in the long run since you can feed less and still provide needed calories to fulfill your pet's nutritional needs.
[Back to Top]

Fiber

What exactly is fiber?
The term "fiber" is used to describe complex carbohydrates that resist enzymatic digestion in the small intestine. Found in the cell walls of plants and grains, the most common fibers are cellulose, hemicellulose, pectin, gums, and resistant starches. Almost all carbohydrate sources will contain some fiber. Some of the most common sources of fiber in pet foods include rice hulls, corn and corn by-products, soybean hulls, beet pulp, dried potato product, cellulose, bran, peanut hulls, and pectin.

Why add fiber to pet food?
Fiber is not considered an essential nutrient in your pet's diet, but it is present in almost every commercial pet food. While pets do not derive any energy from fiber, adding fiber to a diet may improve colon health; help with diarrhea, and constipation; and in dogs may help with weight management and diabetes mellitus. Some fiber is fermented into fatty acids by the "good" bacteria in the intestine. These fatty acids will aid in preventing the overgrowth of harmful bacteria. They will also help the colon cells to recover from injury and possibly help reduce the risk of colon cancer.

Fiber in dog food also helps in the dietary management of obesity. By adding extra fiber (particularly slowly fermented fiber which holds its shape longer) in a specialized weight-loss diet, weight can be reduced and better maintained. The bulk of the fiber helps your dog to feel full without adding calories. Your dog will eat a satisfying meal, but consume fewer calories and thus lose weight. If rapidly fermented fiber source (which loses its shape and bulk quickly) is used at an excessive level, loose stools or excessive gas may result. If problems arise using weight-management pet foods, the fiber source should be examined.

Diabetes mellitus, a common metabolic disease in dogs, is caused when the pancreas fails to produce insulin, a hormone that allows blood sugar (glucose) to be taken up by cells that require it to function. Controlling this disease can be difficult and time consuming. However, diabetic dogs who eat a diet high in fiber experience less fluctuation in blood sugar levels. Feeding diabetic dogs a high-fiber diet has now become standard and many diabetic dogs have been helped.

Why is a high-fiber diet recommended for anal gland disease?
As your pet is viewed from behind, anal glands (also called anal sacs) are located on each side of and slightly below the anal opening, at approximately the 4 'clock and 8 o'clock positions. A tiny duct or tube leads under the skin to an opening directly beside the anus. Unfortunately, these glands may become impacted or infected, and may even abscess.

When anal glands are impacted, your pet will sit down and drag his anal area across the floor or ground. This is called scooting. Your pet may also lick the anal area excessively. Impacted anal glands are a very, very common problem for dogs, especially the smaller breeds. They can also be a problem in some cats.

Pets with recurrent anal gland impactions are often placed on a high-fiber diet to bulk up the stool. Bulky stool puts more pressure on the anal glands, hopefully causing them to express themselves when your pet defecates. While this is not a cure for anal gland disease, it is beneficial in many animals. Several commercial brands of pet food are available in a high-fiber formula. You may also choose to supplement your pet's diet with bran or a product like Metamucil.

If your pet appears to have anal gland problems, discuss a change in diet with your veterinarian.
[Back to Top]

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