

The Dog's Digestive System in a Nutshell

By Maureen Ross, MA

The following is not a replacement for extensive knowledge and/or recommendations from your Primary Veterinarian and/or holistic, nutritional counselors. As a dog training and wellness counselor, I am often asked about nutrition, but seldom asked about the dog's digestive system. Without inundating what can already be a daunting overload of information for most first dog owners, it is as important to know how the dog digests its food as what you feed the dog. How they digestive system works is very different than us humans, and fascinating. How they can tolerate the diets being advocated on the internet, by Veterinarians, manufacturers such as raw food diets, natural and combo/variety diets is worth knowing for health of our pets. It can change your outlook, and help you make decisions based on knowing, rather than simply taking it for granted that this is what we are suppose to do. Read on and then you decide--

It is my opinion that anyone recommending a change in a dog's diet should be educating the "human" client on how the digestive system works. Most of know that our dogs are not miniature, furry human beings. *Canis Lupus Familiaris*, the dog, is classified as a Carnivore, although, you can surf the internet and find that dogs are Omnivores. Let's explore both knowing that it serves no purpose other than to be right or wrong for who-ever wrote it and where they gather their information.

Carnivores are classified as meat-eaters, (Latin, *carne* meaning flesh and *vorare* meaning to devour). An animal derives its energy and nutrient requirements from a diet consisting mainly or exclusively of vertebrate and/or invertebrate animal tissue, whether through predation or scavenging. Animals that depend solely on animal flesh for their nutrient requirements are considered obligate carnivore while those that also consume non-animal food are considered facultative.

Omnivores, (from Latin *omne*—all, everything; *vorare* to devour) eat both plants and animals as their primary food source. They are opportunistic, general feeders not specifically adapted to eat and digest either meat or plan material exclusively. Pigs and crows are well known examples. Humans are considered omnivores too, unless they've chose a specific path toward being Vegans, the operative word being "chosen."

A Herbivore is an animal that is adapted to eat plants and not meat. Herbivores form an important link in the food chain as they consume plants in order to receive the carbohydrates produced by a plant from photosynthesis. Carnivores in turn consume herbivores for the same reason, while omnivores can obtain their nutrients from either plants or herbivores. Due to a herbivore's ability to survive solely on tough and fibrous plant matter, they are termed the primary consumers in the food cycle (chain).

That clarified in a nutshell; let's explore ***the Components of a Dog's Digestive System:***

The visible components are the organs and the physical abilities the dog has available to digest food. There are significant and obvious differences to what we have in our bodies compared to the dogs. The teeth are the most profound example, right with differences in chemistry. Chemistry can seem complicated, but it is paramount for your ability to make sound decisions based on a good understanding of your dog's "real" needs.

You will not be fully educated in physiology or chemistry, but I hope I can give you enough understanding of how important the digestive system is for you to feel the "aha effect" and put it all the abundant information available today into perspective.



The Mouth, Teeth Jaws and Saliva

It doesn't take a dentist to notice that a dog's teeth are different than ours. Look—now at your dog's teeth.

The Dog's Dentition: Each maxillary (inferior and superior) has six incisive and two canine teeth. The superior arch has 8 premolars and four molars, and the inferior arch has eight premolars and six molars, in total the dog has 42 teeth. The incisive teeth are used to cut and rip food, while the rest help grind the food.

The Dog Tooth Structure: The tooth is located in the alveoli. Same as ours, in the interior of the dog's teeth you can find the pulp. When it gets infected, pulpitis is generated. The inner part of the tooth is the root, and the external is the crown. Therefore, if the structure is identical to that of the human tooth, it is logical that the techniques of prevention and treatment are similar or the same. Where digestion is concerned—we are very different, as you will see.

Teeth Growth in dogs: The first dentition is the one of the milk teeth, formed by thirty two teeth, which leads to adult dentition. The dog has only two dentitions. If the adult dog loses a tooth, it will not regenerate. The first incisive teeth appear in the second or third week, the same as the canines. At four weeks, the milk dentition is completed with the exception of the last molar. The puppy swallows the milk teeth that fall, and they are rarely found. At six weeks dentition is complete. At four months the definitive incisive appear. At about five months the adult fangs lose their sharpness. Dentition is complete between the six and seventh months, although I have had dogs teeth until around 11-months.

The FANG-CANINE teeth are there to grab (the big ones on top and bottom) hold and tear. The front teeth scrape meat off of bones (whether real or fake). The incisors (small saw like teeth) grab and hold. The big incisors cut—acting like a pair of scissors.

The molars—larger back teeth are there to crush, very much like us human. The jaws are long most dogs, (except for breeds that have been deliberately manipulated by human breeding to provide a shorter, more human-like face), enabling the fang to grab large objects. The muscles

that control the jaws are some of the most powerful muscles in the dog's entire body; just ask Pit Bull or Rottweiler. They can grab and hold, hold and hold some more.

The dog CANNOT move its jaws sideward. Observe this—it's amazing, just as is dog taking a drink. The tongue tips backwards, not frontwards. We can move our lower jaw from side to side, enabling a grinding process when we chew. Your dog cannot. The fang teeth make it impossible. The jaw joint is a stiff hinge joint, like our knee joints—it does not allow any flexible movements other than up and down. If your dog trusts you, it might allow you to test this by trying to gently move its lower jaw from side-to-side. If you ever get your hands on a skull of a dog (I have at Cornell), you can quickly verify this. From this alone you can make significant conclusions:

Humans who lack all of their teeth get sick or malnourished because they do not digest their food well. Chewing is an important part of digestion. Our stomach does not handle big chunks of food very well. Our stomach works better when food is mixed with saliva. Our saliva contains some important chemicals that assist in the processes of breaking down the food into smaller molecules that our bodies can absorb and "nutritionally" use. These chemicals are called ENZYMES. Enzymes are characterized by stimulating chemical reactions in other molecules they encounter, without being destroyed in the process, as normally would be the case in a more "traditional" chemical reaction. They act as catalysts.

Dog's saliva does not have these enzymes. Dogs have no need for chewing their food! They can't. Their stomach takes care of the digestion without any support from the saliva. The saliva you see when dogs are excitedly waiting for their food—lacks the enzymes. The dog's saliva does have a purpose—it is a lubricant for swallowing.

You can test this if you have mind too, but you need to gather enough of your own saliva and then your dog's, put in it a dish, and do some chemical experimenting. It's gross! For example, take two pieces of apple and two pieces of meat. Put them in the dishes of you and your dog's saliva. Cover them. In a week, human saliva usually looks like cloudy soup. Most likely, the meat and the apple will be transformed, breaking into pieces. You can do this to test vitamins you ingest every day too. In the dog's saliva, you will likely see no change, except a generally cloudiness of liquid, an unpleasant odor, but less strong than humans. The meat and apple piece will likely remain in the dog's saliva as a whole piece.

The Canine Stomach—and How it Digests Food

Humans have approximately 30 feet of intestine. Dogs have about 3-feet. That can help paint the canvas for how differently we digest foods. When you hear the expression "wolfing the food down", that is exactly what wolves and dogs do. They don't spend a LOT of time chewing, although I have noticed my dogs thoroughly enjoy their food, especially when they get older.

Dogs will use their teeth to cut the food into pieces that are just small enough to be swallowed and get through the esophagus into the stomach. You will often see a dog overestimate its own ability to swallow a big piece of meat. It comes back up.

When the food reaches the stomach, which doesn't take long with 3-feet of healthy, intact intestines, the stomach will start a huge production of digestive enzymes and other chemicals that assist in the breakdown of the food into smaller molecules that can be absorbed and used nutritionally by the body. Some of these enzymes are produced by the pancreas, and many by other small glands in the stomach wall itself.

Raw food is not simple to digest. It takes some very strong chemistry to break down the raw proteins. The dog's stomach will produce some large amounts of strong acid, lowering the pH level down to somewhere between 1 and 2. pH=1 corresponds to an acidity you would obtain with a 0.4% solution of Hydrochloric Acid. That seriously corrosive fluid would burn your hands. This very low pH level is much lower than what a human stomach can produce. A human stomach generally operates around pH=5, only two units below the neutral pH=7.

Most enzymes are extremely sensitive to pH. If pH is off what they need, they simply won't function. From this perspective, the enzymes the dog has available for its own digestion is totally different in nature to those you have in your own stomach. This implies that food that is great for a human to digest might not be digestible for a dog and vice versa.

This is amazing and important, at the same time. Think of horses and cattle. They eat grass as their main source of food. Humans cannot digest grass. We cannot digest raw meat and raw bones. Each species has developed its own set of chemicals to digest food it depends on. We cannot draw conclusions from one species to another about what sources of food are "good" and "bad."

What's the Best Food for our Dogs?

Good question. If you come up with a definitive answer, without any flaws, let me know. I'll buy stock and we can become wealthy together. A short answer that holds a lot of truth and experience is that each dog is different at various stages of their lives. Whether you choose a raw diet, a combo diet or make your own varietal diet for your dogs, it is wise to read at least a couple of books on nutrition for your dogs from both perspectives, processed versus raw. Even "natural" kibble is processed, but the newer foods, especially those, in my opinion, without grain are better. However, each dog needs a balance of proteins, fats and complex carbs. Giving our dogs chicken breast 7-days a week isn't healthy either. Balanced is healthy.

In my experience, not all dogs thrive on a raw food diet or want it. I let them decide. When one of my dogs was diagnosed with Osteosarcoma, he let me know by turning away his regular raw food diet. I ended up cooking a balanced portion of meats, veggies and some whole grains (brown rice, quinoa, barley). He loved it, as he did fat-free yogurt that helped get his medications down more easily.

Genetics loads the gun, environment pulls the trigger, but we can make (and change) our choices about our and our dog's well-being throughout a life-span. If a diet is too expensive or impossible to use without stress, then you need consider a higher quality kibble with additional variety added in or create your own with the guidance of a book like [Monica Segal's](#) K-9 Kitchen or www.Kymythy.com (several books). [Dr. Pitcairn](#) is one of my favorite resources as is the [Whole-Dog-Journal](#). For extremely good advice on vaccinations and holistic care [Dr. Jean Dodds](#), [Dr. Marty Goldstein](#) and good overall general site [Natures Pet](#). Enjoy the Journey~