

# EVOLUTIONARY NUTRITION FOR THE DOG

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(*Canis lupus*)

## HISTORY OF THE DOG

The dog/human relationship began approximately 14, 000 years ago. Man gave canines food from the hunt in return for protection at their camp sites through the night. Man chose favorable characteristics in these wild canines such as submissive behavior, keen senses to accompany man on the hunt and protective instincts so as to alert the camp of danger. Here began the first breeding programs and domestication of the dog. From the beginning, man has valued the dog because of his carnivorous and opportunistic nature. Its ability to form strong family bonds with those around him and form packs with a strict hierarchy has also played a major role in the domestication of the species. Fourteen thousand years of selective breeding may have changed the outer appearance and some of the behaviors of our canine companions, but on the inside they have remained virtually unchanged. On the evolutionary scale, this amount of time does not allow for any drastic changes in the physiology and anatomy of a species. Therefore, feeding a dog on a kibble-based diet can be compromising in many ways.

## TAXONOMY

**Order:** Carnivora **Family:** Canidae **Genus:** Canis **Species:** Canis lupus **Subspecies:** Canis lupus familiaris

In 1993, after the DNA testing of *Canis lupus* (the wolf) and *Canis familiaris* (the dog), scientists renamed *Canis familiaris* as a subspecies of the wolf: *Canis lupus familiaris*. This was because findings concluded that the wolf and the dog were so genetically similar that they must be named as the same species (for more information visit The Molecular Evolution of the Dog Family by Robert Wayne: <http://www.idir.net/~wolf2dog/wayne2.htm>).



### **ANATOMY AND PHYSIOLOGY**

The dog's anatomy and physiology shows the clear picture of a predator. Looking first at the head, the eyes are located at the front of the head to enable forward vision of prey as they hunt. Large nasal passageways with many capillaries enable the dog to pick up chemical scents undetectable to humans. This allows them to track prey over long distances. The mouth includes large canines and a strong muscular jaw that enable the wolf/dog to crush prey items in a matter of seconds, as well as tear large pieces of meat from a carcass. The strong jaws also allow for the crushing of bones, which are rich in calcium and fat. The carnivore jaw does not allow for the sideways movement that herbivore jaws possess, but only an up and down action, perfect for crushing and tearing meat and bone. Being carnivores, dogs possess this trait.

Inside the digestive system, the stomach is large and muscular, making it possible to eat large amounts of food in a small time span. Timber wolves have been documented eating up to 20 pounds of meat in on sitting! This ensures that the animal is able to eat enough to sustain itself for as long as possible. The rest of the pack of up to 20 members must also eat from the same carcass. The stomach is highly acidic, allowing for ingestion of whole bone pieces that can be broken down into a powder-like substance. This extraordinary acidity also allows a canine to ingest large amounts of harmful bacteria without being affected. This provides dogs with the ability to eat rotting carcasses in times of need, a good survival mechanism. The pancreas of the dog is much smaller than a human's and only contains a fraction of the enzymes that we are able to produce. This means that the food items that a dog eats must come complete with the active enzymes needed to bind with stomach acid and break down food for absorption. In dogs, meat enables this process to occur naturally. Cooked food items and grain items are highly

indigestible for any canine species, since cooked food contains only dead enzymes and dogs do not possess the enzymes needed to break down grain. For example, Amalayze is found in the saliva of humans and is used to break down starch in the mouth. Canine saliva does not contain enzymes and is only used as a lubricant for swallowing large pieces of food. The intestine and the bowel of a carnivore are much shorter than a human's, allowing for quick absorption and elimination of food and waste products. Carnivores have also evolved to absorb almost all of the water content from prey items. This allows a carnivore to be hydrated for long periods without needing a water source.

The impressive muscular structure of the canine family allows for quick movement when chasing prey and the ability to tackle and subdue animals many times larger than themselves.

Canines also have the unique ability to go for days without eating and can lose up to 40% of their bodyweight without dying. This is an impressive survival feature.

All of these traits have allowed the order Carnivora to survive and thrive on carnivorous diets for 60 million years. Domestic dogs' ancestors roamed the earth millions of years before the appearance of the first human. This makes the evolutionary features of the modern canine family a truly winning design.



### **THE DIET OF THE DOG**

Because of the various canine features discussed above, it is logical to conclude that the diet of the dog should be closely linked to the diet of wild canines like the wolf. This gives us a strong foundation for how to feed our own dogs. According to the Wisconsin Department of Natural Resources, the Timber Wolf (the dog's closest living relative) diet is comprised of 55% white-tailed deer, 16% beavers, 10% snowshoe hares, 19% rodents and other small mammals. The wolf and the wild dog ingest almost the entire carcass of the prey they catch. This means that there is a small amount of pre-

digested vegetation eaten when the stomach (tripe) of an herbivore is eaten. According to the University of Michigan Museum of Zoology, feral domestic dogs eat small animals as their main source of food. During tough seasons when meat is harder to come by, wolves and wild dogs become more opportunistic, eating eggs, fish, fermenting fruit, seeds, nuts and grasses to supplement the meat that they are able to catch. This adaptability is another beneficial survival tactic although dogs cannot sustain themselves forever on these limited food sources.

Your dog can be fed in the exact same way. There are several meats you can choose from and many different prey items including: beef/buffalo meat and bones, chicken necks/carcasses, turkey necks, turkey meat, lamb meat, lamb necks, venison, offal and tripe. According to a wild canine diet, dogs should eat anywhere from 75-85% meat, bone, offal and tripe. 15-25% of the diet should be composed of pureed green matter such as parsley, kale, dandelion, chard and a small portion (25% of the total vegetables) of pureed root vegetation and fruit including parsnips, yams, squash, apples, pears, and berries. Always keep in mind that you should keep the diet accurately proportioned, using a prey animal as your model of proportions to feed.

#### **KIBBLE VS. RAW**

There are several major ways that kibble and raw diets differ:

1. Kibble usually contains grain content (wheat, corn, barley, oats) that is more plentiful than the meat content. This is a problem for 2 reasons:
  - a. Dogs have no nutritional requirement for carbohydrate.
  - b. Dogs do not produce enzymes to digest grain or obtain nutrients from it.
2. Kibble diets contain cooked meat and meat by-products which are also hard to digest and absorb nutrients from. Enzymes are destroyed in the cooking process.
3. The nutritional analysis information listed on every bag of kibble is based on laboratory test results. The food sources present in the kibble may *contain* the appropriate nutrients but the *bioavailability* (digestion and absorption) may be poor. There has never been a bioavailability test done on any brand of kibble. This means that no one knows if our dogs are actually absorbing adequate nutrients from the food they are eating. There are also no long term studies conducted for how dry foods affect dogs over their entire lifetime. Usually test trails are short, under 1 year and are conducted on younger animals.
4. Because the pancreas of the dog is so small, it must work hard to break down commercial dog food. This means that pancreatic enzymes are depleted quickly and used to break down food with inadequate nutritional content. In turn, the body uses an unfortunate survival tactic: it begins to absorb enzymes and other essential nutrients from its own tissues to maintain the equilibrium of the body. This can only remain an equilibrium for so long and may prove to shorten the life spans of our dear canine friends.
5. Kibble is systemically dehydrating to dogs, as their bodies are designed to absorb water from their prey. To compensate, they must drink large amounts of water to stay hydrated. This puts extra strain on the kidneys.

6. Kibble and canned dog foods often contain toxic fillers like preservatives and dyes. Sugar and other taste enhancers are also found in some commercial foods to entice animals to eat it. Eating these substances daily can pose health risks.
7. Often, synthetic vitamins are added to commercial canine diets. These vitamins are not molecularly/nutritionally equal to the natural source vitamins found in raw food sources.
8. Kibble has only been formulated in the last 100 years. It is absurd to assume that dogs have evolved to eat kibble-based diets in this short amount of time. Evolution of physiological and anatomical proportions takes hundreds of thousands, if not, millions of years.

In comparison, the raw diet is rich in fresh meat sources. Meat, tripe, bone, organ and a portion of pureed vegetation are filled with the enzymes needed to properly digest and assimilate nutrients. Nutritional analyses have been done on several types of raw prey items and they do contain all the essential nutrients required by the dog. Bioavailability of prey items has not been studied in a laboratory but it has definitely proven to make for resilient animals in the wild. Wild canines are capable of surviving in harsh conditions with few or no chronic health problems. Kibble has only been fed to dogs for approximately 100 years, whereas raw meat diets have fed the order Carnivora for 60 million years.

#### **MAKING THE SWITCH TO RAW**

The most successful way to switch your dog to a raw food diet is to begin adding a good quality (no additives) canned dog food to the diet. Eliminate any dry food as quickly as possible and begin to mix small amounts of raw into the canned food. You may find your dog may need anywhere from 3 days to 2 weeks to make the transition smoothly, depending on age, weight, activity level and health status. If you are noticing loose stools or vomiting early in the process, cut back the amount of raw food being fed. Use the original amount of raw the dog was comfortable with and begin increasing the raw more slowly than before. It takes time to build up a proper acidic environment in the gut. This can lead to indigestion in some dogs during the transition. Always make sure the meat you are feeding is fresh and of good quality.

During the transition to a raw meat diet, you should begin to notice positive changes in your dogs' health, including a shinier coat, decreased body odor, cleaner smelling breath, cleaner teeth that can be maintained with bone chewing instead of dental work, and better overall organ health e.g. an appropriate decreased water consumption = healthier kidneys. Problems that have improved on raw meat diets include but are not limited to impacted anal glands, skin problems, allergies, kidney and liver problems, pancreatic problems, digestive problems and poor dental health.

On another note, animals that have any kind of existing health concerns or are having trouble making the switch to a raw diet should only proceed with a diet plan approved by a veterinarian versed in raw feeding for dogs. For more information on holistic nutrition and veterinary practice, visit [www.vancouveranimalwellness.com](http://www.vancouveranimalwellness.com).

## BOOKS

The Ultimate Diet: Natural Nutrition for Dogs and Cats by Kymythy Shultz

The Barf Diet by Dr. Ian Billinghurst DVM

## WEBSITES

Guide to writings on Predation, Food and Feeding Habits, Nutrition Studies of the Wolf:

<http://www.albany.edu/~knee/pred.html>

Order this very insightful e-book “The Wolf’s Natural Diet: A Feeding Guide For Your Dog?” online at:

[http://k9joy.com/TheWolfsNaturalDiet/index.php?camp=1212\\_wolf](http://k9joy.com/TheWolfsNaturalDiet/index.php?camp=1212_wolf)

Dr. Ian Billinghurst’s site: [http://www.barfworld.com/html/learn\\_more/evolutionary.shtml](http://www.barfworld.com/html/learn_more/evolutionary.shtml)

Robert Wayne’s wolf/dog study: <http://www.idir.net/~wolf2dog/wayne2.htm>

Vancouver Animal Wellness Hospital: [www.vancouveranimalwellness.com](http://www.vancouveranimalwellness.com)

Timber Wolf Nutrition from the Wisconsin Department of Natural Resources– percentages of food items within the diet: <http://www.dnr.state.wi.us/org/land/er/factsheets/mammals/wolf.htm#Food>

The University of Michigan Museum of Zoology – Canis lupus familiaris (the domestic dog) behaviour, reproduction, taxonomy and nutrition including information on feral domestic dog diets:

[http://animaldiversity.ummz.umich.edu/site/accounts/information/Canis\\_lupus\\_familiaris.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Canis_lupus_familiaris.html)

The Chronology of Wolf Evolution - <http://www.searchingwolf.com/wevolve.htm>

Club Canine Raw Food for Dogs and Cats – [www.clubcanine.net](http://www.clubcanine.net)

## DISCLAIMER

**The above information is not meant to be used to treat animals for medical problems nor should it take the place of proper veterinary medicine. For more information on raw canine diets, please contact a veterinarian who has experience with the diet and uses it to supplement their practice.**

## ABOUT THE AUTHOR

Sarah Griffiths is the nutritional consultant at Vancouver Animal Wellness Hospital. She started working in a pet store at the age of 17 and worked as the reptile/amphibian keeper, learning basic herpetology for over 30 species of snakes, lizards and frogs designing natural terrain environments for different species of reptiles and amphibians. She moved into species appropriate nutrition when she managed a raw food dog and cat store for 2.5 years and her first dog and cat became patients Adored Beast Veterinary Clinic, now Vancouver Animal Wellness Hospital. She worked for 1 year as a domestic/wild animal trainer and keeper at Creative Animal Talent Inc. in Aldergrove, BC and had the unique pleasure of helping raise a pack of Timber Wolf cubs and working with another pack of adult Arctic Wolves. Forming a bond through food was a very important part of raising the cubs and she saw first hand that the diet her dogs were thriving on was the same diet the wolves ate. Sarah has also had the honor of working with several species of large cats including Cougars, African Servals, Caracals, Fishing Cats, Cheetahs, Geoffrey’s Cats, Asian Leopard Cats, Asian Golden Cats, Rusty Spotted Cats, a Clouded Leopard and an Ocelot. She currently works as a volunteer at Mountainview Conservation and Breeding Centre in Langley, B.C. which includes over 100 endangered species including 14 species of wild cats, two packs of African Wild Dogs and brown hyenas that are fed raw carcass diets. She is currently in her third year of four at the Vancouver Homeopathic Academy to receive a diploma in homeopathic medicine for humans. Other education she has received and is enrolled in include: Veterinary Nutrition: An Integrative Approach from Standard Process Nutrition, Exotic Cats: Husbandry and Basic Medicine from The Veterinary Information Network. Sarah’s goals include practicing homeopathy for animals, obtaining a degree in Zoology specializing in Carnivores, working towards the conservation of wild habitats across the world and starting a rescue centre for exotic cats, canines and primates that need homes. Sarah currently has 2 Bullmastiffs, a Great Dane, 4 cats and a Percheron Draft Horse, all of which are fed on biologically appropriate diets.