

Carnivore Cuisine

From the Saint Louis Zoo Nutrition Department

Carnivores are animals that eat meat as part or all of their diet. All carnivores' bodies are adapted for their specialized feeding. They have canine teeth for tearing flesh, and a pair of carnassial teeth (top first molar, bottom last premolar) for shearing meat. Carnivores also have a very simple digestive tract (stomach and intestines) for dealing with a (chemically) quite simple meat-based diet of protein and fat.

But **obligate** carnivores – those eat *only* meat, have some special physiologic adaptations that truly make them diet specialists. The domestic cat is the best-studied model for carnivore adaptations. The few studies that have been done with larger cat species (lions, cheetahs) show some of the same adaptations, so the cat seems to be a good nutritional model for all Felidae. In fact, some studies done with carnivorous reptiles (alligators), and birds (vultures, owls) also show exactly the same dietary limits, so the cat may be our best model, at this point, for ALL carnivorous vertebrates. Just what are the special features and major nutrient categories that set a CAT diet apart from a DOG diet?



- **Carbohydrates:** The ultimate “Atkins” diet participant, cats lack glucokinase enzyme activity and cannot utilize carbohydrates well for energy, relying instead on dietary fat and protein.
- **Protein:** Cats require higher dietary protein levels than other species, and have a dietary requirement for the amino acid Taurine – since they excrete metabolites of this sulfur-containing compound in their urine.
- **Fat:** Cats lack a specific enzyme (Δ -6 desaturase) to make an essential fatty acid – arachadonic acid – and must obtain it from their diet.
- **Vitamins:** Cats do not efficiently meet vitamin D needs from sunlight exposure alone, and rely on the diet to provide. Additionally, cats cannot convert plant pigments (beta-carotene) to vitamin A, as many animals can, so must also obtain vitamin A directly from the diet.

None of this is really a problem when cats (or other carnivores) are fed meat-based diets or whole prey. That’s because whole bodies or properly formulated mixes (more than just meat) contain levels of these nutrients that “balance” with animal requirements. Keeping this in mind is key. **Remember: diets designed for canines won’t fill your cat’s cravings!**