

## Thoughts about the Clinical Dietetics of Dog and Cat

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The nutrition of the companion or breeding dog and cat is more and more based on commercial complete feeds. The evolution of carnivorous animals produced a wide range of digestive types, from the strict carnivorous cat to the just omnivorous racoon. The dog is situated in the middle, a carnivorous animal with some omnivorous characteristics. As an all over consequence is that the digestion of lipids is excellent both in dogs and cats; that of the proteins only of medium and the carbohydrate utilisation of dogs is medium to low and very low in cats. The explanation for the medium protein digestion is that in the nature both species eat animal proteins of high biological value. Dogs, compared to the real omnivorous animals, like pig, require much more protein and fat; however, he needs carbohydrates, too and is capable of utilising them. To understand the real nutrient requirements of dog and cat, it should be borne in mind that wild carnivores eat not only the meat (muscles) of the prey animals, but first of all they consume the viscera (liver, kidneys, intestines), providing in this way themselves by carbohydrates, plant fibres, minerals and a series of vitamins.

### Feed intake, peristalsis, faeces quality

Dogs (and generally Canidae) are such type of carnivorous, which are capable of ingesting huge amount of feed for once. This characteristic has been developed owing to the haphazard, periodic feeding, the bad predictability of the next prey and the competition with the herd mates present. Consequently, the dog is prone to greedily eating and superficially chewing. On the other hand, to help herd mates, that are unable to hunt (lactating bitches, weaning pups), a special form of trophallaxis developed. It means that hunters eat huge amount from the killed prey, but they vomit it for the others. Sometimes it occurs also by jealousy or enviously in kennels. Felidae, except lions, eat many times smaller portions in a day.

The mode of dog's feed intake primarily depends upon the consistency of its feed. Small bites are taken up by the incisors and swallowed without thorough chewing. Larger pieces are fixed by its legs and with the head turned aside, shred it with his carnassial teeth. Secretion of some digestive juice began already during the feed intake. Excellent sight and smell of cat facilitate the catching of the prey. The maintenance requirement of an adult cat is approximately 1.8 mice/kg of LW (indoors) and 2.1 mice/kg LW (outdoor) of 27 g of LW, containing 32% DM, 18% crude protein, 9.5% ether extract, 3.4% ash and 0.1% N-free extract (Fekete., *et al.* 1996), the calculated ME-value is 0.16 MJ/mouse ("mouse unite", Fekete, 2003). this explains the feeding habit: many times, smaller portions, having the daily needs of 7 to 10 mice. The calculation based on the requirement data of NRC (2006), taking 0.293 MJ ME/kg of LW for indoors and 0.335 MJ ME/kg of LW for outdoors adult cat of optimum BCS.

### Comparison of some eating behavioral traits of dog and cat

Dogs, but especially cats during grooming, swallow hair, which may form hairball. To trigger vomiting, both species graze. Consequently, for the indoor cat "cat grass" (commonly germinated cereals) should be provided. Lack of available, appropriate "cat grass", cats are inclining to gnaw ornamental plants. There are many plants and household products that are toxic to cats, for example *Aloe vera*, *Dieffenbachia* (dumbcane), onions, tyelol. It has been proven that many times cats will chew on the houseplants out of sheer boredom. Vomiting helps also to get rid of other indigestible materials, like bones, plastic etc.). Differences of the post-absorptive metabolism of dog and cat see later.

Feed preference. Voluntary dry matter intake depends upon a series of external factors. The general paradigm (“eating on energy”) is less decisive for the carnivores, especially for cats. Cats tend to eat approximately the same amount (per kg LW) of feeds having different energy density (Morris, *et al.* 2006). Adding cellulose to the feed mixtures, dogs significantly increased their dry matter intake; on the contrary, cats ate practically the same amount of dry matter (Prola, *et al.* 2006). From the endogenous factors the gastric emptiness, the sight, smell, touch and taste, previous experiences and the composition of blood plasma (the level of individual nutrients, hormones, peptide, the ratio of amino acids etc.) should be mentioned. Important exogenous factors are the access to the feed, feeding frequency, amount of portion, physical form, colour and tastiness. Feed preference basically depends on the lipid content, (it is stimulated also by the presence of sweet amino acids (glycine, alanine, lysine, histidine, cystine and proline), nucleotide, the umami-taste and the level of common salt. Dog and cat, being carnivorous, prefer animal protein better than the plant. They feel high-fat and high-protein diet as more tasty. “Digest” is a product of partial protease fermentation of slaughter house by-products (viscera, chiefly intestine and liver) and it is applied to improve the preference of dog and cat feeds. Sweet sugar taste (from glucose, sucrose, fructose and lactose, but not from maltose, as well as from sodium cyclamate) is a positive stimulus for dog, but neutral for the cats, having no sweet receptors (Li, *et al.* 2006). Cats are also insensitive to salt (Bradshaw, 2006), rather prefer some amino acids and nucleotides; dogs have an aversion towards sodium saccharine.

Both species, but especially cat is prone to develop an exclusive preference to the taste of the feed (addiction). Cats remember to the diet-linked negative experiences (e.g. LiCl stimulated vomiting), dog, on the contrary, makes the same feed choice failure repeatedly (Bradshaw, 2006). The excellent taste and preference of a commercial diet does not automatically mean an outstanding nutritional value! At the same time, amino acid imbalance reduce voluntary feed intake. The final preference of a feed is the outcome of the physical form, texture, water content, and dustiness, measure of bites, taste, microbiological status, mouldiness and rancidity. In case of a very tasty and concentrated feed, sometimes the rationing is necessary to prevent development of obesity.

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