

Life-Stage Nutrition



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Canine and feline life-stage nutrition, in contrast to one complete diet for all ages, can be justified. Requirements of nutrients are greater for growth, compared with the maintenance phase. Thus, a complete diet contains nutrient levels, higher than needed by adult animals. Worth noticing, phosphorus intakes, required for growth, might be harmful for senior animals. There is suggestive evidence that nutrient supply affects risk of age-related disease. Adult animals might benefit more from extra intakes of vitamin E and eicosapentaenoic acid (EPA) than growing animals. Many pet food lines consist of puppy or kitten food, adult and senior foods. Few lines, take into account the relationship between age and nutrient requirements, and that between nutrient-mediated prevention of age-related diseases.

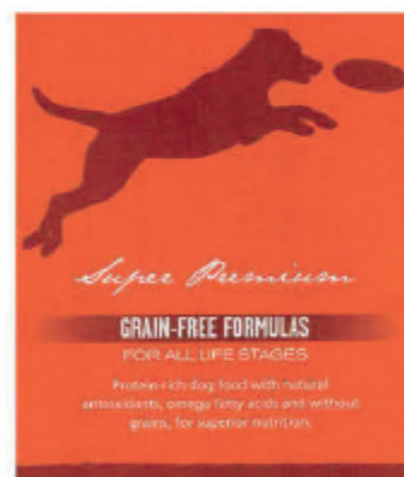
Various committees of experts have set the nutrient requirements of dogs and cats, as based on the available scientific literature. The US National Research Council uses the term recommended allowance, which is defined as the concentration or amount of a nutrient in a diet formulated to support a given physiological state. Thus, the allowances prevent nutrient deficiencies and sustain normal growth and development or the maintenance of body functions in adulthood.

Nutrient requirements are best expressed per unit of food energy. The nutrient allowances for growing and adult animals have been fixed. In general, young growing pets need higher concentrations of nutrients in their food than do their

adult counterparts. Specific allowances for senior dogs and cats are not yet determined.

Indirect evidence indicates that certain nutrient intakes lower or higher than the recommended allowances have health benefits. Without solid proof, deviation from the allowance is justified when it is safe and likely to be effective. Solid proof or disproof is obtained only through well-designed, long-term trials using different diets with the amount of nutrient under study as the sole variable. Reproducibility of the outcome should also be demonstrated.

This communication focusses on the composition of foods. Portion size is also important for pet health. Restricted feeding regimens, so as to achieve



Front page of brochure: complete pet food for dogs of all life stages

or maintain ideal body condition of dogs may impair the development of osteoarthritis and cancer and increase life span.

Protein

Cats need more protein in their diet than dogs. The graph also shows that the protein requirement of puppies is much higher than that of adult dogs. Kittens require slightly more protein than adult cats. The figures concern total dietary protein, providing the required amino acids and include a digestibility factor.

Protein allowances for senior pets have not yet been established. In a singular study, geriatric dogs with surgically-induced chronic kidney disease, were

fed a diet with high- (19.4 g/MJ), instead of lower-protein level (10.4 g/MJ). High protein intake led to more severe kidney lesions. In another singular study, senior dogs appeared to require more protein (9.0 g/MJ) than the allowance for adult dogs (6.0 g/MJ), in order to maintain cellular protein contents. For the time being, the amount of dietary protein for senior dogs should be 50 percent higher, but no more, than that for younger, adult dogs. This notion should be applied to life-stage nutrition.

Calcium

The recommended allowance of calcium is greater for growing (0.72 g/MJ) than for adult dogs (0.24 g/MJ). The amount of calcium is critical for puppies of large breeds. For young, growing Great Danes the ideal calcium level (0.47 g/MJ) appears lower than the recommendation; higher calcium intakes may induce skeletal disorders (osteochondrosis). Thus, an all-breed puppy diet should contain less calcium than the allowance.

Phosphorus

The phosphorus allowance is higher for growing (0.60 g/MJ) than for adult dogs (0.18 g/MJ). The allowance for adult dogs is close to the minimum requirement that just prevents phosphorus deficiency. Low versus high phosphorus intake reduces the progression of chronic kidney



Image of packaging: complete pet food for adult dogs as part of a life-stage line

disease in cats and dogs. It is feasible that low dietary phosphorus curbs chronic kidney disease, which typically develops in senior cats and dogs. Phosphorus concentrations in senior canine foods should approach the allowance for adult dogs, but not be lower.

Vitamin E

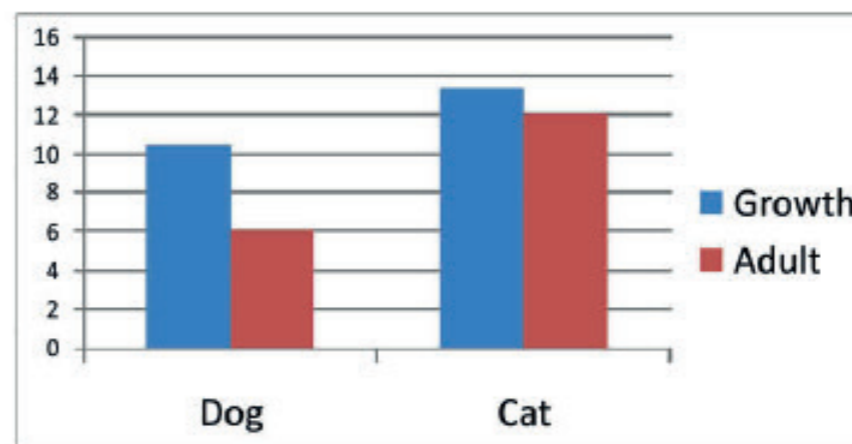
In dogs, blood concentrations of vitamin E tend to fall with ageing. Furthermore, there is suggestive evidence that vitamin E supplementation counteracts the ageing-induced decrease in immunity, decrease in learning behaviour and the development of senile dementia. Fortifying senior foods with more vitamin E than the recommended allowance can be substantiated.

EPA

A body of evidence indicates high EPA intake is effective in the treatment of joint disorders (osteoarthritis) and chronic kidney disease in dogs and cats. The effective EPA dose is much higher than the recommended allowance for adult dogs (14.5 mg/MJ) and cats (1.5 mg/MJ). Possibly, a preventive EPA effect is elicited by enrichment of adult and senior foods with a multiple of the recommended allowance.

Dr Beynen will be writing this exclusive column on dog and cat nutrition and nutrition-related items every month.

Recommended allowances of protein for growing and adult dogs and cats



The requirements are expressed as grams (g) of crude protein per unit (MJ) of available food energy (1 Megajoule = 1000 kilojoules = 239 kilocalories). For converting the figures into the percentage protein in dry food (energy content = 1.5 MJ/100 g), multiplying by 1.5 is practical.