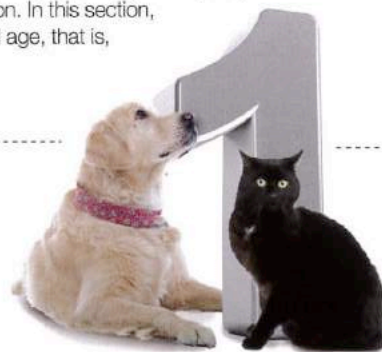


# Requirements in

The primary objective of feeding and nutrition in the last stage of life of our pets is to try to prolong their quality of life and life expectancy, delaying the appearance of the symptoms of dysfunction. In this section, we will only discuss the recommendations for healthy dogs and cats of advanced age, that is, that have no pathologies (especially CKD).

## 1 Each geriatric patient is unique

The first rule that should always be considered is that each geriatric patient is an individual, due to the great variety of particular situations that appear at these ages. As in other stages of life, it is impossible to generalize: the requirements from the age itself must be considered along with those derived from incipient or concomitant pathologies.



## 2 The daily energy requirements are lower

In general, in the last third of our pets' lives, and due to the changes that take place in their bodies, including poor functioning of the thyroid gland and less physical activity, the daily energy requirements decrease by between 12 % and 20 % (some authors reference up to 40 %). This effect is somewhat lower in cats, possibly because their physical activity and the changes that take place in their bodies are not as accentuated as those that occur in canines. On average, 15 % is estimated.



DER = ↓12-20 % (40 %)



15 %

### Examples

What are their energy requirements?



13 years and 12 kg

$$\text{DER (kcal ME/day)} = 85 \% \times 132 \text{ (kcal)} \times \text{body weight (kg)}^{0.75}$$

$$\text{DER} = 112 \times 12^{0.75} = 724 \text{ kcal ME/day}$$



15 years and 5 kg

$$\text{DER (kcal ME/day)} = 85 \% \times 100 \text{ (kcal)} \times \text{body weight (kg)}^{0.67}$$

$$\text{DER} = 85 \times 5^{0.67} = 249 \text{ kcal ME/day}$$

These estimations are contradictory with the loss of weight and muscle mass in the geriatric phase. Therefore, the energy recommendations will depend on the losses that are produced, differentiating if they are due to a state of cachexia or anorexia/hyporexia.

✓ For cachexia, in spite of our efforts to increase the calorie and nutrient intake, it is difficult to achieve improvements to the animal's body condition, especially regarding the muscle mass, although weight can be regained.

✓ On the other hand, and given that the fatty tissue continues to deposit itself in the organism, the veterinarian should monitor that food ingestion is correct to prevent the pet from becoming overweight.



# healthy geriatric animals (I)

## 3

### Hydric requirements

- ✓ According to studies in human medicine, water requirements could be slightly increased as the thirst control and satiety systems are found to be affected by the aging process.
- ✓ In controlled environments, the ingestion of liquids is correct, but when these liquids are not available, or due to certain changes in the osmolarity of the liquid (hyperosmolarity), heat or exercise, geriatric patients respond with less thirst and less ingestion of liquids. When faced with this situation, the water requirements and recommendations must be estimated. The best rule to follow is to offer fresh clean water at all times.



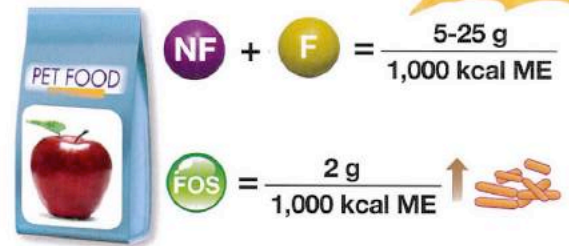
## 4

### Be careful with the level of carbohydrates and fiber



- ✓ In old dogs and cats, who may sometimes suffer from senile diabetes, and in the absence of further studies that show the intrinsic mechanisms of this action, using high levels of carbohydrates or ingredients that elevate the glycemic index rapidly is not recommended. Using foods with a moderate amount of starch and rich in fiber is recommended; for example: sorghum, barley and rye.
- ✓ There are no specific carbohydrate requirements, but considering their limitations, values close to 95 g/1,000 kcal ME are recommended.

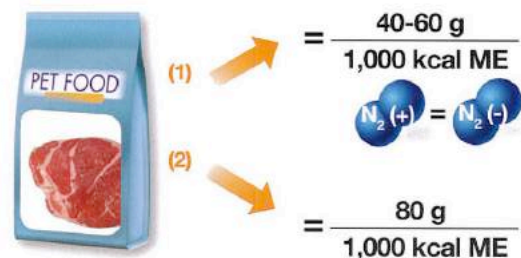
- ✓ Regarding fiber and its physiological effects on the digestive process, considering that certain old animals suffer constipation, the type of fiber should be mixed (fermentable and non-fermentable fiber) and the levels incorporated should not be increased. The highest values are reserved for those animals that are less active and overweight.
- ✓ At the same time, fiber may help to compensate the changes to the microbiota. Incorporating fiber with prebiotic characteristics determines an increase in the lactobacillus and bifidobacterium populations in the colon and a decrease in the count of fecal clostridium. The following values help to maintain a healthy microbiota.



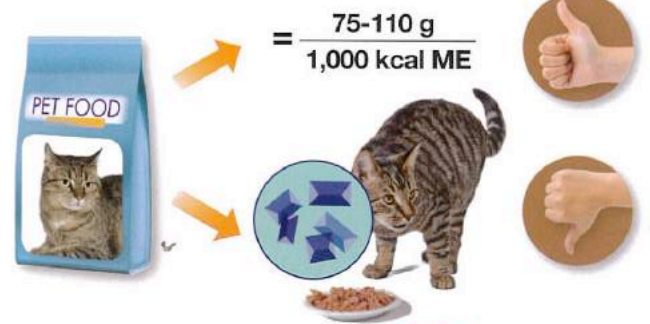
## 5

### More and better quality protein

- ✓ Taking into account the changes that take place as a result of aging and the differences in the quality of raw materials, the value shown in (1) is recommended to maintain the nitrogen balance at zero and the immunocompetence in dogs. However, gains in muscle mass are obtained when protein levels are near the value (2). These diets help to:
  - Slow down protein depletion.
  - Collaborate in the response to stress.
  - Re-establish the immune system to values comparable to those found in young animals.



- ✓ For cats, it seems that the use of 75 to 110 g of protein/1,000 kcal ME could be sufficient. In both species, it is preferable that the protein be of high quality, with a digestibility greater than 80 %.
- ✓ Foods for patients with renal disease and those that include minimal levels of protein or protein of poor quality, are not adequate to feed our healthy geriatric patients.



### To be taken into account

There is no evidence that supports the idea that reducing the levels of protein ingested delays or avoids CKD in a healthy animal (its effect is only positive when CKD is diagnosed). Therefore, reducing the ingestion of protein or its recommendations is not necessary just because they are old.



# Requirements in

## 1 Lipid requirements

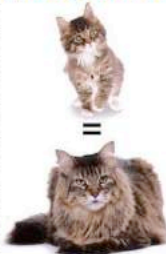
### Energy and palatability

The fat requirements will depend on the patient's body condition. Lipids provide high energetic density and palatability to food rations so that we can improve the consumption and the general condition of our elderly animals, by increasing the concentration of fats in the food rations.

### Essential fatty acids

In addition, fats provide EFAs that, as we have already seen, have a limited synthesis in older dogs.

### In cats, their requirements do not vary with age



The fat requirements in cats do not change over time with the aging process in spite of the fact that their digestibility is affected.

This fact allows us to increase the levels of this nutrient in the pet's food to compensate for the loss of body fat.



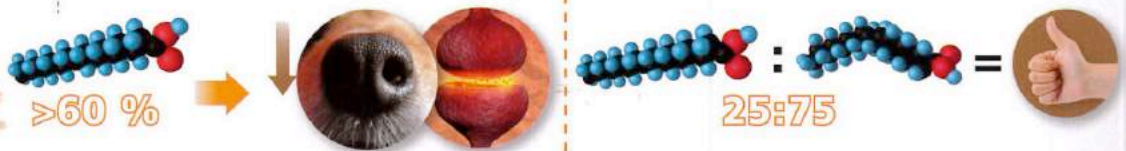
### Benefits for skin and fur

Maintaining the recommendations of 25 to 38 g of fat (up to 65 g in cats)/1,000 kcal ME in older, non-obese animals provided benefits on the quality of the animals' skin and fur, body condition and improves ingestion.



### The fat profile is important

It has been documented that an increase in the proportion of saturated fatty acids (>60 %) reduces olfaction. At these levels, the permeability of the membranes is altered, which in turn affects the activity of the sodium-potassium pump in the synapses. A proportion of 25:75 of saturated:unsaturated fatty acids is recommended.



## 3 Practical management of feeding

✓ As a result of the reduction of the senses and the changes in the metabolism, foods for senior dogs and cats should have a high energy content (>4 Mcal/kg DM), and they should be highly palatable and digestible.

✓ The texture of the food will depend on the pet's oral health. Softer kibbles or wet food are preferable. When faced with the possibility of an animal developing senile diabetes, semi-wet foods are not recommended given that they use simple carbohydrate humidifying agents.



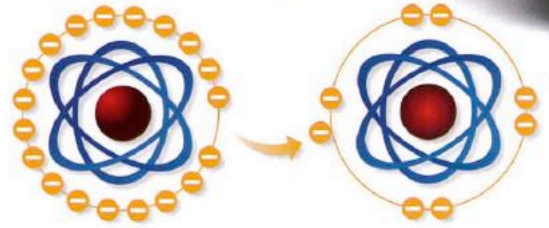
# healthy geriatric animals (II)

## 2

### Vitamin and mineral requirements

#### Antioxidants against free radicals

In this stage of life, the vitamin and mineral requirements are not affected in healthy patients. It may be interesting to pay attention to the nutrients with antioxidant activity to compensate for the cellular damage that takes place due to the increase in free radicals from oxidative stress.



#### Calcium for correct bone mineralization



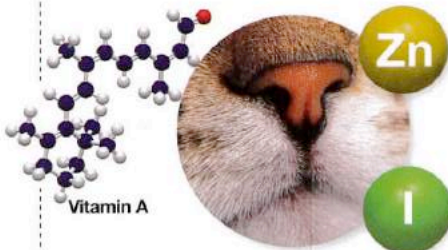
Slight bone loss occurs in cats and is possibly associated with the decrease in lean mass. There is also secondary bone loss to compensate for metabolic acidosis, with a decrease in the urinary pH, and therefore a predisposition to urolithiasis from calcium oxalate. To avoid these situations and maintain correct bone mineralization, levels of calcium around 1.5-2.5 g/1,000 kcal ME are recommended along with a modification of the DEB (dietary electrolyte balance) that will ensure a pH close to 6.4-6.6.

#### Potassium as a stimulant in feline ingestion?

It has been suggested that increasing the potassium recommendations can stimulate ingestion in older cats (hypokalemia causes nervous system signs and lethargy), but there is no scientific evidence that supports this fact in healthy animals. In commercial foods for senior cats, we can find that potassium may be increased by up to 15 %.



#### Vitamin A, iodine, or zinc to improve the sense of smell



It has been described in human medicine that deficiencies in vitamin A, iodine, and zinc cause a loss of the sense of smell. One of the effects of aging, as we have previously explained, is the loss of the sense of smell. There is no previous research that demonstrates this in pets, but incorporating any of these nutrients may serve to help in the cephalic phase of the digestive process.



Based on the changes that take place in advanced age pets, attention should be paid to the following points:

- ✓ **Maintain adequate oral health.** Check that the teeth and gums are healthy.
- ✓ **Manage the pet's appetite appropriately.** Try to ensure that the pet ingests their daily ration even if different methods must be implemented to increase ingestion.
- ✓ **Break the total food ration into two or three meals per day.** Large volumes of food are not needed.
- ✓ **Minimize any stressful situations.** For hospitalized animals, we can try to make their hospital environment as similar as possible to their home environment; with care by the most highly trained staff (very friendly and caring with the animals), we can even take them from the cages to other rooms to see if they will eat better there or have the owners come (if possible) during meal times.
- ✓ **Decide at which age** it is recommended that these type of foods be administered.



### To be taken into account

We must remember that the fat requirements in cats are always higher than those for dogs as a result of their metabolism as strict carnivores.

