Nutrition for Senior Dogs: New Tricks for Feeding Old Dogs

Senior dogs commonly present to veterinarians for primary care and represent approximately one third of the pet dog population. Life spans are increasing and thus both the percentage and the age of elder dogs may be increasing. Pet owners perceive that most pets, including senior dogs, are healthy and do not require a therapeutic food, but they are still left with hundreds of pet foods from which to choose. Advice and information recommending the best food is available almost anywhere—from trainers to pet food retailers, from magazines, internet sources, and social media. It is important to remember, however, that there is no established AAFCO nutrient profile for a “senior” life stage; thus the nutrient content of products marketed for senior pets varies widely. This makes it even more critical for the veterinary health care team to play an active role in providing credible nutritional advice, especially for senior dogs that have unique nutritional concerns.
Physiologic changes that occur in middle-aged and senior dogs make them less tolerant of nutritional deficiencies or excesses.

WHAT IS OLD?
The point at which a dog progresses from adult to a senior or geriatric life stage is variable and subjective. Life expectancies vary widely among dogs depending on breed and body size. Aging changes can also be variable, including loss of senses (hearing or vision), reduced energy requirements and lean body mass, as well as a decline in various organ functions. The American Animal Hospital Association (AAHA) Senior Care Guidelines suggest that, with the exception of large-breed dogs, most dog breeds reach middle age by 7 to 8 years of age and should be considered seniors when they reach the last 25% of the predicted life span for their breed. Despite this arbitrary categorization, physiologic changes that occur in middle-aged and senior dogs make them less tolerant of nutritional deficiencies or excesses. Middle-aged dogs are “at risk” or more vulnerable to age-related health problems. Middle age may bring an increasing incidence of chronic diseases, many of which can be influenced by nutritional management.

The nutritional assessment should include a “senior” screen or health risk assessment for early detection of health problems and adjustments to care to prevent or slow onset of age-related diseases. Every senior health screen should include a thorough nutritional assessment followed by an individualized nutritional recommendation.

THE NUTRITIONAL ASSESSMENT
Before any diet changes are recommended, a nutritional evaluation should be performed. Each nutritional assessment and recommendation should include three components: the patient, the diet, and feeding management factors. An accurate diet history is invaluable when assessing the nutritional health of the patient and will be vital to formulating an individualized diet plan. Understanding the nutritional changes that occur with aging and identifying any changes in the individual patient can help the clinician better match the appropriate food with the patient’s unique needs. The patient, the food, and the pet owner’s feeding practices are interrelated and require reassessment. Health and nutritional status are not static, especially in senior pets, but rather a dynamic process worthy of continued reevaluation and treatment modifications to match changing needs of the pet.

Patient Assessment
An initial assessment of the patient can be done quickly and utilizes information collected as part of a health assessment: a complete medical and diet history and a thorough physical examination and appropriate lab work (eg, complete blood count, serum biochemical profile, urinalysis). The nutritional screening process (Table 1) can quickly identify patients with “nutritional” risks. Healthy seniors (those without identified risks) that are eating a nutritionally balanced diet, have a healthy body weight, good body and muscle condition scores (BCS, MCS), and are free of significant

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Initial Screen: Assessing for Nutritional Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>History of:</strong></td>
<td><strong>Requires extended evaluation if ✔</strong></td>
</tr>
<tr>
<td>Treats/snacks/human foods &gt;10%</td>
<td></td>
</tr>
<tr>
<td>Inadequate information/inappropriate feeding/food</td>
<td></td>
</tr>
<tr>
<td>Unconventional diets</td>
<td></td>
</tr>
<tr>
<td>Previous/ongoing medical problems</td>
<td></td>
</tr>
<tr>
<td>GI signs</td>
<td></td>
</tr>
<tr>
<td>Life stage needs</td>
<td></td>
</tr>
<tr>
<td>Time of spay/neuter</td>
<td></td>
</tr>
<tr>
<td><strong>PHYSICAL EXAMINATION</strong></td>
<td></td>
</tr>
<tr>
<td>Any abnormal BCS (&gt;5/9)</td>
<td></td>
</tr>
<tr>
<td>Any MCS &lt;3</td>
<td></td>
</tr>
<tr>
<td>Unintentional weight loss OR gain</td>
<td></td>
</tr>
<tr>
<td>New medical condition</td>
<td></td>
</tr>
<tr>
<td>Poor skin/hair coat</td>
<td></td>
</tr>
<tr>
<td>Dental disease</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Table 2, AAHA Nutrition Assessment Guidelines

BCS = body condition score
MCS = muscle condition score
physical or laboratory abnormalities need no further evaluation at this time. A pet-specific nutrition assessment and recommendation for healthy seniors can be done quickly. Nutritional recommendations should include the specific name of food that matches the pet’s current nutritional needs, the amount and frequency for feeding, and a monitoring plan. In many of these patients, the feeding recommendation involves little or potentially no change, but should include a verification and validation for the owner that the current food and feeding plan meets the pet’s needs, and a documentation of the current feeding plan in the medical record.

If nutritional risk factors or age-related problems are identified, an extended evaluation and management plan is indicated (Table 2). This in-depth evaluation should address some common age-related conditions that may be influenced by nutritional management:

- Weight management: achieve or maintain a healthy body weight
- Osteoarthritis
- Cognitive dysfunction

**Diet Assessment**

A complete diet history is important for evaluating the pet’s current nutritional status. Ideally, the animal’s exact diet (brand and amounts eaten) should be obtained as well as all snacks, treats, and nutritional supplements by type and amount. The drug/supplement history should include questions about the use of food to administer medication, as it may comprise a significant portion of the dog’s intake. Diet history information combined with the patient assessment provides information about the patient’s daily caloric requirements and specific nutrient intake, which should be compared with the patient’s individual needs. For example, an overweight pet with a robust appetite should not be fed a calorie-dense product. Reducing the amount of a high-calorie product could lead to deficiencies of other essential nutrients and increase hunger or undesirable food-seeking behaviors.

**Feeding Management Assessment**

Feeding practices and preferences influence a pet’s intake. Determine whether other pets present competition or limit access to food. Determine whether food is accurately measured, how much / how often food is offered, and how much is eaten. Determine if there have been recent changes to the feeding plan and why, as well how the pet accepted those changes. This information will allow the veterinary team to determine the nutritional adequacy of the current diet, as well as help identify factors that could contribute to potential success or problems with adherence to a new recommendation.

---

**TABLE 2**

Extended Screening: Assessing Senior Dogs for Nutritionally Relevant Age-Related Factors

<table>
<thead>
<tr>
<th>Abnormal body condition</th>
<th>Is this pet overweight or underweight?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet</td>
<td>Is the pet eating appropriate amounts of a balanced diet?</td>
</tr>
<tr>
<td></td>
<td>Assess appetite and intake</td>
</tr>
<tr>
<td></td>
<td>Assess ability to eat: prehension, mastication, swallowing for those underweight and/or with poor intake</td>
</tr>
<tr>
<td></td>
<td>Assess sensory input: smell, vision, palatability of food. Consider palatability enhancer if necessary</td>
</tr>
<tr>
<td>Mobility and access to food and water</td>
<td>Is the pet able to walk? Access to food provided? Able to stand to eat?</td>
</tr>
<tr>
<td></td>
<td>Other pets or physical limitations impairing access?</td>
</tr>
<tr>
<td>Mobility and exercise</td>
<td>Is the pet’s MCS normal (3/3)?</td>
</tr>
<tr>
<td></td>
<td>Presence of osteoarthritis, lameness, pain? These play a role in maintenance of comfort, fitness, and healthy BCS</td>
</tr>
<tr>
<td></td>
<td>Activity minimizes sarcopenia</td>
</tr>
<tr>
<td></td>
<td>Exercise and activity provide mental stimulation and environmental enrichment</td>
</tr>
<tr>
<td>Cognitive function assessment</td>
<td>Disorientation/confusion: becomes lost or confused, fails to recognize familiar people?</td>
</tr>
<tr>
<td></td>
<td>Changed interactions with family members? Isolates or seeks attention less often?</td>
</tr>
<tr>
<td></td>
<td>Change in sleep/activity cycles? Wanders or paces, sleeps more in day, less at night?</td>
</tr>
<tr>
<td></td>
<td>Loss of house training (nonmedical reasons)</td>
</tr>
</tbody>
</table>

BCS = body condition score
MCS = muscle condition score
Reassessment and Modification of Treatment Plan
Nutritional assessment of senior pets is an ongoing process. Dogs experience a variable and wide variety of metabolic changes as they age. It is important to communicate and engage pet owners to create the expectation of continued reassessment and treatment modifications that accommodate the specific changes observed in each individual dog rather than adopting a “senior” protocol. A vigilant monitoring plan allows early detection of problems if they arise and a better opportunity to intervene or modify the pet’s individualized nutritional plan to improve its health. Partner with clients to help ensure success and maintain adherence to the feeding and monitoring goals.

EFFECTS OF AGING ON NUTRITIONAL NEEDS

Energy
Aging results in changes to both structure and function of the gastrointestinal (GI) tract; however, no studies report clinically relevant differences in nutrient absorption between young adult and geriatric dogs. \(^7\) Maintenance energy requirement (MER) is defined as the energy required to keep an animal in a “maintenance state,” or maintaining a normal activity. MER varies depending on factors such as breed, health, neuter status, and age. As dogs age, MER decreases ~25%, with the greatest decrease at middle age (7 years). \(^8\) Loss of lean body mass (LBM) appears to be the primary factor influencing the reduction in energy requirements. \(^9\) Lean body mass accounts for about 96% of an animal’s basal energy expenditure. \(^10\) Aging dogs are less active, which also contributes to reduced LBM and MER. If no adjustments are made to the pet’s energy intake to account for the reduction in LBM, activity, and MER, then the senior pet will gain weight and the risk for obesity will increase. Body condition score should be closely monitored in older dogs to prevent obesity because unhealthy weight gain exacerbates many age-related conditions. A higher protein to calorie ratio diet would be beneficial to promote ideal weight maintenance in senior pets identified at risk for obesity. \(^11\) Results from Purina’s lifetime study revealed lower disease incidence, later onset of disease, and increased life span in calorically restricted dogs. Dogs fed a 25% reduction compared with controls lived an average of 13.0 years compared with 11.2 years. \(^12\) Maintaining energy balance and avoiding unhealthy weight gain is one of the most important goals for senior dogs.

Water
Elder humans exhibit decreased thirst and drinking when challenged by fluid deprivation. Although not confirmed in dogs, a similar response is expected. \(^5\) Thus water intake should be monitored or ensured when elder dogs are exercising or exposed to hot environments. Senior dogs may also be at risk for dehydration if they have subclinical renal insufficiency. When a senior pet’s appetite is good but water intake is suspect, add water to the food to ensure adequate intake and hydration.

Protein
Protein requirements increase with age due to increased protein turnover and reduced protein synthesis. \(^13,14\) Healthy senior dogs do not benefit from protein restriction \(^15\) and may be harmed by limiting dietary protein. \(^16\) Protein restriction of seniors could be more detrimental than protein deficiency in younger animals. \(^17\) As a general guideline for estimating minimum daily protein needs, provide 2.55 g protein per kg body weight (BW) or ~1 g protein per lb BW. \(^13,17,19\) This level of protein intake should minimize risk for protein deficiency. Senior dogs, however, may need up to 50% more than this. \(^13\) Older dogs also require fewer calories, or less food, than younger dogs. Diets for older dogs should not only contain fewer calories but more protein or a higher protein:calorie
ratio to meet age-related nutritional needs. Based on the diet history, assure the dog is meeting minimum daily protein needs (~1 g protein/lb BW minimum). Food with 25% of calories from quality protein should meet the needs of most healthy aged dogs and minimize loss of LBM. Assess MCS to monitor LBM.

**NUTRITIONAL INTERVENTION FOR SELECTED AGE-RELATED DISEASES**

Although the most common age-related conditions are best managed with a multimodal approach combining nutritional strategies, exercise or environmental enrichment, and possible medical management, this discussion focuses on nutritional management.

**Overweight/Obesity**

Hyperadiposity, the most prevalent form of malnutrition, contributes to many of the diseases linked with obesity.21-23 Still, pets that are overweight go unrecognized or may not have this health concern addressed. Based on the canine life span study,12 which demonstrated many negative health consequences of being overweight, weight management should remain a top priority for senior pets. Yet it remains one of the most significant health problems among middle-aged and elder dogs. Monitor the pet’s diet, BW, BCS, and MCS at each visit. Once excess weight is diagnosed, action should be taken to achieve healthy BW and BCS. Creating a negative energy balance promotes weight loss. This is best achieved by feeding low-calorie foods with increased protein content and increased nutrient:calorie ratio to assure adequate intake of essential nutrients.

**Degenerative Joint Disease**

Osteoarthritis (OA) affects as many as 20% of dogs and obesity is recognized as a primary risk factor.24 Nutritional strategies for OA include the following:

- **Weight and Muscle Management** Loss of excess body weight/fat can improve clinical signs of lameness in arthritic dogs.25 Strategies to maintain healthy body weight, BCS, and LBM and prevent sarcopenia should be prioritized for senior dogs. This can be achieved by selecting a complete and balanced diet that meets protein and other nutrient needs while providing the amount of calories to prevent excess body fat gain. The goal is to delay onset / prevent progression of OA.

- **Long Chain Omega-3 Fatty Acids (n-3)** show the greatest evidence for synovial antiinflammatory effects26,27 compared with other nutraceuticals. Marine oils (eicosapentaenoic acid [EPA] > docosahexaenoic acid [DHA])28 are preferred with more effective antiinflammatory effects compared with shorter-chain flax or other plant-source n-3 oils. There is no standard accepted dose.

- **Cognitive Dysfunction**

As many as 20% to 68% of middle-aged to elderly dogs experience cognitive dysfunction or behavioral changes, which can manifest in varying degrees of mental decline (see Table 2). Nutraceuticals may have potential use both in prevention and treatment, but are best when combined with environmental enrichment.30-32

- **Antioxidants** The brain is especially susceptible to free radical damage and cognitive dysfunction. Multiple studies have shown improved clinical signs of age-related cognitive changes in dogs fed antioxidant-enriched diets or supplements.30-32

- **Medium Chain Triglycerides (MCTs)** Supplementation with MCTs has been shown to improve cognitive performance and preserve brain structure of elder dogs. MCTs provide an alternative cerebral energy source by way of ketones without restricting dietary carbohydrate or proteins.34,35

- **Supplements versus Enriched Diets** One caveat for using nutraceutical supplementa-
tion is that that these supplements have not been adequately assessed for efficacy, optimal doses, or nutrient interactions. When considering a diet containing the supplement or prescribing a supplement, assess the nutrient composition of the “base diet.” Confirm that the base diet meets the macronutrient needs of the patient and that it will provide an adequate dose of the intended supplement as fed. If not, it would be prudent to select a more appropriate diet and give the intended dose of supplement.

REFERENCES


