

Weight Loss in Senior Cats
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Prevalence of weight loss in senior cats

The AAFP/AAHA feline life stage guidelines define a senior cat as 11 to 14 years old and a geriatric cat as 15 years and older.¹ The term 'senior' is often used to refer to all cats over about the age of 10 years and will be used as such in these notes. The easiest problems to detect in senior cats are weight loss and decline in body condition, but they are also problems that may challenge the clinician's diagnostic and therapeutic skills. In addition, not all pet owners appreciate the significance of these signs in older animals. In a recently published study of responses to an internet survey, only 73% of respondents felt that weight loss warranted veterinary attention in a senior animal.²

The prevalence of obesity decreases with age in cats; in fact, senior cats have a tendency to be underweight.³⁻⁶ In a report of 191 cats at the Waltham Centre for Pet Nutrition (Melton Mowbray, United Kingdom) ranging in age from 1-13 years, the heaviest cats were neutered males aged 5-8 years while cats over 11 years had a tendency to exhibit lower body weights than younger cats.³ In a survey of over 2,000 cats presented to veterinary hospitals in the Northeastern United States, the proportion of overweight cats increased until 7 years of age, after which it declined, especially in cats over 10 years of age.⁶ Similar patterns were found in another study, where the proportion of overweight cats peaked at 7 years and the proportion of underweight cats increased sharply at 11 years.⁷ Longitudinal data collected on 53 healthy cats over 11 years of age at the Waltham Centre indicates that for most cats, weight loss or weight maintenance rather than weight gain is a feature of old age.³ After 8 years of age, 50% of cats in that report maintained weight and 30% lost weight. It appears that a significant proportion of obese middle-aged cats die before reaching old age (e.g., from diseases such as diabetes mellitus or hepatic lipidosis) and a similar proportion lose weight into their senior years. Those senior cats that are obese have probably been obese for most of their lives.

Causes of weight loss in senior cats

The reasons for a tendency to weight loss with aging in cats are probably complex and interrelated. Maintenance energy requirements (MERs) in cats decrease by about 3% per year up until about 11 years old.^{8,9} After 11 years of age, MERs actually increase and may contribute to the tendency of senior cats to be underweight if their energy needs are not met. An investigation of changes in body composition with aging found that lean body mass drops dramatically after 12 years of age, and that by age 15, cats may have a mean lean tissue mass under 2 kg (4.4 lb), one-third less than cats aged 1-7 years (mean 3 kg [6.6 lb]).⁵ This loss of lean body mass in aging cats in the absence of disease is termed sarcopenia. Mean percentage body fat also decreases progressively after 12 years of age so that the lean body mass to fat ratio does not show significant changes with aging. The combination of reduced lean mass and body fat contributes to the frail look of many elderly cats. Sarcopenia is also an important problem in the aging human population, affecting 20-40% of people in the seventh and eighth decades of life and contributing to morbidity and decreased quality of life.¹⁰

Adult cats require 2 to 3 times more protein in their diet than adults of omnivorous species. A healthy young to middle-aged adult cat requires at least 5 grams of protein/kg body weight/day whereas older cats probably require more. Cats can certainly utilize carbohydrates as an energy source, but they have a limited ability to spare protein utilization by replacing it with carbohydrate. Changes in digestive efficiency occur with age and may contribute to weight loss and increased protein requirements. Older cats are less efficient at digesting fats and proteins.¹¹ In one study, 22% of cats over 14 years old had protein digestibility of less than 77% and 33% of cats over 12 years old had fat digestibility of less than 80%.¹² To compensate, senior cats may need to increase their daily food intake by as much as 25%.¹³ In a study of 85 senior cats on a long-term feeding study (over 7 years), there was a significant increase in total kcal/kg body weight ingested and total daily food consumption in cats from 10 to 15 years of age.^{8,14} Despite the increase in caloric intake, body weight decreased with age, particularly after age 13.

Unfortunately, there is very little data available on changes in gastrointestinal tract function with aging in cats to explain this decline in digestive efficiency. In humans, reduced secretion and activity of pancreatic lipase and reduced capacity for the production, transport and secretion of bile acids has been documented with aging. It is tempting to speculate that similar mechanisms might be at play in cats.

While changes in feeding patterns occur with age in some species and may contribute to weight loss, this does not seem to be the case in cats. One study evaluated the effect of age on feeding patterns and determined there was no difference between feeding patterns of younger cats (average age 3 years) and older cats (average age 11.6 years).¹⁵ Cats of all ages consumed regular small meals during both day and night. However, owners tend to feed senior cats differently than younger cats. In a telephone survey evaluating feeding of non-therapeutic diets to 429 adult cats, those cats 12 years of age and older were more likely to be fed canned foods and table scraps compared to younger cats.¹⁶

The dogma that all older cats should be fed reduced energy 'senior' diets must be re-evaluated as more is learned about nutritional needs of older cats at various ages.¹⁷ Currently, there are no AAFCO or NRC nutrient requirements established for senior cats. In addition, the nutrient profile of commercially available senior cat diets varies widely.¹⁸ A feeding plan must be tailored to body condition and the presence of diseases as well as life stage. Considering the available data on metabolism and body weight in aging cats, it seems likely that many elderly cats, particularly those over 12 years of age that are not overweight, would benefit from frequent small meals of energy-dense, highly digestible diets with protein of high biological value to maintain body weight and lean tissue mass and avoid protein/calorie malnutrition. The AAFCO minimum for cats is 6.5 g/100 kcal of diet, but higher levels are likely more optimal.¹⁹ Senior diets are highly variable in protein and caloric content. Protein/calorie malnutrition is associated with important detrimental effects such as anemia, hypoproteinemia, delayed healing, decreased immune function and compromised function of major organ systems (gastrointestinal, pulmonary, cardiovascular).²⁰ Despite the numerous advantages of feeding canned diets to senior cats (e.g., increased water content, higher proportion of animal source protein), most canned diets have a lower caloric density based on volume fed than dry diets. Therefore, attention must be paid to ensure the caloric intake of cats on canned diets is appropriate.

Other reasons for the susceptibility of senior cats to lose weight may include the presence of diseases (including those causing pain) and decreased appetite due to dulling senses of taste and smell. Cachexia is the loss of lean body mass associated with chronic disease. In senior cats, cachexia and sarcopenia may occur together. Early detection of weight loss and loss of lean body mass is important as it may lead to early detection of disease. A study of 258 cats in a Nestle Purina colony that died of cancer, renal failure and hyperthyroidism determined weight loss started about 2.5 years before death.⁸ Cats dying from other causes started losing body weight even earlier, about 3.75 years before death. Body weight loss two years prior to death was over 6% in cats with cancer, renal failure and hyperthyroidism. During the last year of life, the average weight loss was over 10% for cats dying of all causes. Gradual weight loss is often overlooked by owners. Therefore, the body weight and body condition score should be determined and recorded at every opportunity, since weight loss may be the earliest sign of disease. Percentage weight change is an easily performed calculation ($[\text{previous weight} - \text{current weight}] / \text{previous weight}$) that detects subtle trends. Muscle condition scoring is also useful in senior cats for early detection of loss of body condition. It is important to note that diseases causing weight loss in senior cats are not always associated with inappetence. Since weight loss can occur with either an increased or decreased appetite, it is important to encourage owners to report any *change* in appetite.

Finally, cognitive dysfunction syndrome (CDS) is suspected to occur in cats as it does in aging dogs, although formal diagnostic criteria for cats are lacking.^{21,22} Age-associated brain pathology has been documented.²³⁻²⁵ The signs of CDS are mainly behavioral and include disorientation, altered interactions and sociability, disrupted sleep-wake cycles, altered activity levels and patterns, excessive vocalization, anxiety and irritability, and decreased grooming. In addition, alternations in appetite could lead to weight loss.

Diagnosis of weight loss in senior cats

Diagnosis of weight loss in senior cats is dependent on thorough data gathering since there are many potential causes. In human geriatric medicine, a mnemonic consisting of ten "D's" has been suggested to determine the causes of involuntary weight loss (see Box 1)^{26,27} and many of these categories are useful considerations for

senior cats as well. In elderly humans, the most common causes of weight loss are depression, cancer and benign gastrointestinal disease.

A complete history, including a nutritional history, is the first step in diagnosis. Diet quality should be investigated to ensure the patient is receiving an adequate amount of energy and protein. Attention should be paid to trends in food and water consumption and questions should be asked about signs of pain, behavior changes, changes in elimination patterns, and changes in mobility as well as presence of vomiting or diarrhea. Senior cats often have more than one health problem and may be receiving multiple medications, many of which cause gastrointestinal distress including anorexia, such as NSAIDs, antibiotics and cardiac medications. A detailed behavioral history should be obtained for clues to medical problems including CDS. A thorough physical examination should include assessment of weight and body condition, an orthopedic examination, and blood pressure measurement. Specific areas that may yield valuable clues include:

1. Oral cavity: dental and oral diseases (e.g., periodontal disease, tooth resorption, oral tumors) are common in older cats and may be associated with pain and decreased appetite; feline orofacial pain syndrome is a neuropathic disorder most commonly found in the Burmese breed in the U.K.²⁸
2. Eye: an ocular examination, including the retina, may provide evidence consistent with systemic hypertension as well as conditions such as glaucoma, neoplasia, and infectious diseases (e.g., toxoplasmosis, cryptococcosis)
3. Neck and thorax: thyroid nodules associated with hyperthyroidism may be palpable and cardiac changes associated with hyperthyroidism or hypertension (e.g., tachycardia, arrhythmia, heart murmur) may be appreciated; decreased thoracic compressibility may be associated with masses or effusions
4. Abdomen: thickening of the intestinal wall and mesenteric lymphadenopathy may be associated with inflammatory bowel disease or neoplasia; abdominal masses associated with neoplasia may be found; cranial abdominal pain may be associated with pancreatitis; changes in kidney size and shape may be associated with chronic kidney disease, polycystic kidney disease, feline infectious peritonitis, hydronephrosis secondary to a ureterolith, pyelonephritis or neoplasia
5. Musculoskeletal system: muscle wasting may be evident especially over the lumbar area; swelling, pain and stiffness in joints may be associated with degenerative joint disease

Causes of weight loss in senior cats may be categorized by quality of appetite. With a normal or increased appetite, diseases causing malabsorption or maldigestion (e.g., inflammatory bowel disease, gastrointestinal lymphoma) or excessive protein loss (e.g., protein-losing nephropathy or enteropathy, diabetes mellitus, hyperthyroidism) must be considered. With a diminished appetite, investigations must focus on oral cavity disease, systemic diseases (e.g., neoplasia, chronic kidney disease, liver disease, gastrointestinal disease, retroviral infection) and diseases causing pain (e.g., degenerative joint disease).

The minimum laboratory database for investigation of weight loss in senior cats includes a complete blood cell count, serum biochemistries and electrolytes, total T4, complete urinalysis, and retroviral testing. Most common causes of weight loss in this age group will be quickly diagnosed or eliminated with this minimum database. Cats with protein/calorie malnutrition may have lymphopenia, anemia, lower than expected BUN and creatinine, and increased liver enzymes and bilirubin. In severely protein deficient animals, serum total protein and albumin may be reduced. Serum creatinine kinase activity may be a useful marker for assessment and monitoring of nutritional status in cats. In one study, serum CK was significantly increased in hospitalized anorectic cats compared to non-anorectic cats, and was significantly lower after 48 hours of nutritional support via nasoesophageal tube.²⁹

Depending on the physical examination findings and results of initial testing, further laboratory investigations may include bile acid testing and extended thyroid hormone testing. Pancreatic (e.g., chronic pancreatitis) and gastrointestinal disease (e.g., inflammatory bowel disease, lymphoma) are common causes for weight loss that may not be readily apparent from the history, physical examination and initial laboratory testing. Blood tests for pancreatic and gastrointestinal disease include cobalamin, folate, and feline pancreatic lipase immunoreactivity. Finally, more advanced diagnostics will be indicated for a subset of patients, such as abdominal imaging or endoscopy. Exploratory laparotomy or laparoscopy should be considered when the cause of weight loss remains undiagnosed. During surgery, samples for histopathology should be collected even if the

tissue appears grossly normal. Sites to sample include liver, pancreas, lymph nodes, stomach and multiple areas of the small intestine.

Non-specific management of weight loss

The best chance to reverse weight loss is to diagnose and treat underlying diseases. However, non-specific measures for nutritional support are often part of the treatment plan. Encouraging increased food intake can be accomplished by feeding an energy-dense, nutrient-dense diet that is palatable to the cat – some cats prefer diets with high moisture content while others prefer dry diets. Examples of appropriate diets include diets designed for growth and recovery or critical care. Box 2 discusses ways to encourage senior cats to eat. Even if a therapeutic diet is recommended, initially it is best to feed familiar foods as learned aversions may be induced by feeding novel foods to sick or hospitalized cats. It is better for a sick cat to eat any food rather than no food at all. Slow introduction of the recommended diet can be made once the cat's condition and appetite have improved and it has been discharged from hospital.

Short-term use of appetite stimulants may be helpful in some anorexic cats. For example, midazolam (2-5 µg/kg, IV) has been reported to stimulate appetite within 2 minutes without sedation or other side effects.³⁰ If adequate food intake cannot be achieved, nutritional support via tube feeding should be considered. Nutritional support should be considered earlier rather than later for moderately to severely malnourished cats. Some anorectic patients with diseases such as advanced renal disease, hepatopathy, protein-losing gastrointestinal disease or protein-losing glomerular disease will benefit from early nutritional support before significant weight loss occurs. This may be especially true for cats with neoplasia. In one study of 57 feline cancer patients, median survival time of cats with a body condition score less than 5/9 was 3.3 months compared with a mean survival time of 16.7 months for cats with a body condition score of 5/9 or greater.³¹

Cats are solitary feeders by nature and elderly cats often do not cope well with competition and stressors. Therefore, many older cats in multi-cat homes would benefit from being fed separately or being offered supplemental meals. Owners should be educated to monitor the daily food intake of senior cats carefully. One way to do this when cats are fed individually is to weigh food bowls before and after feeding. Many owners are willing to measure the amount fed and record the amount the cat has eaten; this can be valuable information for the clinician.

Box 1: The ten D's for weight loss in elderly human patients

1. Dentition
2. Dysgeusia (an altered ability to taste)
3. Dysphagia
4. Diarrhea
5. Disease (chronic)
6. Depression
7. Dementia
8. Dysfunction
9. Drugs
10. Don't know

Adapted from:

Robbins LJ: Evaluation of weight loss in the elderly, *Geriatrics* 44:31, 1989.

Wise GR, Craig D: Evaluation of involuntary weight loss. Where do you start?, *Postgrad Med* 95:143, 1994.

Box 2: Ways to encourage senior cats to eat

1. Offer fresh favorite and familiar foods to avoid learned aversions
2. Use wide, shallow food and water bowls
3. Warm the food to body temperature

4. Moisten the food
5. Feed in a quiet, stress-free environment
6. Use encouragement (e.g., petting) and praise during feeding

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