The Other Malnutrition: Unintentional Weight Loss in Cats

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In cats, unintended weight loss has a significant impact on health and wellness.[1-4] Weight loss that is not planned is often a sign of a more pressing underlying issue. A complete physical and nutritional evaluation should be performed to determine the underlying cause of the weight loss. Diseases that affect caloric intake, absorption of nutrients across the gut, and utilization of those nutrients should be investigated. If prolonged, inadequate nutrition resulting in weight loss may lead to the development of serious clinical sequelae such as hepatic lipidosis.[2,5] A rational approach to the patient with unintentional weight loss is based upon a sound understanding of the relevant biologic, pathophysiologic, and environmental factors that may be playing a role. Although we recognize that old age is not a disease in and of itself, the effects of aging on nutrient digestion and absorption, body weight, muscle mass, metabolism, nervous and immune systems, kidneys, and joints must be monitored in older patients. Undiagnosed or untreated age-related diseases may be partly responsible for the difference between cats that "look their age" or older and those that do not.[6] Often those that do not are free of age-related disease or are appropriately treated for the specific age-related disease. Mature pets should be routinely evaluated for age-related diseases. Many of these disease conditions can be managed nutritionally and this will aid in insuring the patient experiences improved care, quality of life, and longevity.

An overall decline in body weight without changes in body composition is one of the main features of physiologic alterations in aging cats. Cats tend to gain body weight steadily up to age 9. After this, body weight generally begins to decrease. Unlike other species, cats do not appear to exhibit an age-related decline in daily energy requirement (DER).[6-8] On the contrary, it appears that in cats older than 11 or 12 there is an increase in DER.[9,10] This increase is believed to result from the following:

- a relatively constant low level of physical activity throughout adult life
- lack of body composition changes
- higher rate of protein turnover.

Protein turnover increases in older animals, often causing a matching loss of muscle mass. Thus, the cat loses weight with aging. However, in cats this weight loss involves both lean and fat mass resulting in an overall body composition that again, does not change dramatically. This decline in body weight is important for the veterinary healthcare team to note, because cats that died of cancer, CKD, or hyperthyroidism were reported to have lost weight for 2.5 years before death; whereas, cats dying of other causes lost weight over a longer period.

It has also been reported that as cats age, they experience a decline in certain digestive capabilities due to alterations in GI function.[11,12] A study comparing the digestive capacity of young, mature, and old cats, found the mature cats to have the highest digestive capacity for dry matter, protein, fat, and starch, and the old cats had the lowest.[13] Fat digestion is noted to have the most significant decline in senior cats, with the incidence affecting 10% to 15% of cats aged 7 to 12 years and one-third of cats over 12 years of age.[6] This decrease in digestive capacity for fat in aging cats has resulted in pet food manufacturers formulating senior feline diets with decreased fat concentrations. However, it may be judicious to increase the dietary fat concentration to allow these cats to consume enough calories to maintain their body weight. Older cats are more likely to be underweight than obese because feline DER does not greatly change with age and may increase but digestive efficiency decreases.[6]

Digestive capacity for protein also declines in senior cats, affecting 20% of cats over 14 years of age.[6] Senior cats digest only 77% or less dietary protein – much less than the normal range of 85% to 90%. With decreased digestive capacity for protein, in addition to increased protein turnover, senior cats should be fed ample dietary protein to allow maintenance of lean body mass.

Additionally, altered metabolic responses to food were seen in older cats as compared to younger cats. Aging is associated with peripheral insulin resistance in cats, with higher concentrations of insulin, leptin, and adiponectin in lean 8- to 9-year-old cats vs. lean 1-year-old cats.

Being obligate carnivores, cats have a higher requirement for protein and amino acids than other species. When nutrition is inadequate, energy is derived from mobilization of amino acids from muscle stores as

opposed to fat.[3] Cats are also particularly sensitive to changes in environmental factors, such as the timing and location of feeding, as well as the food type; smell and “mouth feel” may also play into their willingness to eat

Maintaining Feline Body Weight

A reduction in food intake is known as hyporexia, whereas loss of appetite is known as anorexia. It is important for veterinary healthcare teams to understand this difference in terminology to appropriately manage weight loss in cats. To maintain body weight, it is crucial to provide adequate caloric intake, maintain reliable absorption of nutrients across the gut, and ensure efficient utilization of nutrients and energy sources. Alteration of these components will affect the ability of a patient to maintain body weight and can ultimately lead to unintentional weight loss. These same factors play a role in maintenance of healthy body weight in cats. When assessing cats for weight loss it is important to consider all components of body composition; which include body weight, body fat, and lean muscle.

Cats are very sensitive to food form, odor, and taste. Cats familiar with a certain texture or type of food may refuse foods with different textures. Cats do prefer certain ‘flavors’ such as animal fat, protein hydrolysates (digests), meat extracts, and certain free amino acids found in animal muscle (i.e., alanine, proline, lysine, histidine and leucine). The temperature of the food plays a role in whether the cat will accept and eat the food. When feeding canned/moist foods, the preference is for the moist food to be at, or near, body temperature (38.5ºC [101.5ºF]). All these factors are important to the proper caloric intake with cats.

Environmental factors will also influence calorie intake in cats. Changes in diet, feeding routine, or access to food (e.g., increased competition with other pets in household) can ultimately affect the number of calories consumed per day. Cats that are ill or stressed may not be as willing or able to compete with other cats for access to food or simply may not have enough energy to move to the food bowl. Diseases that cause vomiting and nausea will also affect the cats’ willingness to eat enough calories. As diseases progress patients who fail to consume adequate calories will ultimately experience unintentional weight loss. Veterinary team members must understand the factors as early recognition is key.

Utilization of nutrients

Determining whether the patient is eating is only part of the equation. Adequate absorption and efficient utilization of nutrients from the gut is a significant piece to maintaining optimal body weight. Diseases that alter gastrointestinal integrity, absorptive capacity, gut motility, or general function may contribute to unintentional weight loss. The presence of infectious organisms or alterations in normal microbiota can result in changes in structure and function of the gut. Failure of nutrients to cross the gut wall at normal rates may be associated with diseases that result in maldigestion and or malabsorption. Failure of normal absorptive processes result in inability to maintain body weight and ultimately weight loss.

Disease states can also affect the rate of nutrient loss from the body. Non-GI disease can also play a role in nutrient or calorie loss. For example, patients with renal disease will exhibit an increase daily loss of calories due to increased metabolic rate within the kidney. In humans, inflammatory cytokines such as tumor necrosis factor and interleukins are suspected to play a role in development of unintentional weight loss by altering gut function and metabolism.[14]

Cachexia vs. Sarcopenia

Cachexia is a condition characterized by weight loss, loss of muscle mass/lean body mass with or without loss of adipose tissue mass and systemic inflammation. It is often associated with hyporexia and inadequate nutrition.[15,16] Cachexia is differentiated from conditions such as sarcopenia, starvation, hyperthyroidism, and malabsorption. In cachexia, negative protein energy balance develops because of inadequate nutrition combined with an abnormally increased metabolic state, results in a loss of muscle mass and body condition. In addition, the systemic inflammatory state associated with various chronic disease processes leads to catabolism of muscle via both protein and fat degradation, as well as impaired ability to stimulate protein synthesis. Cachexia is a clinically important condition to recognize as it has been linked to increased morbidity and mortality.[17]

Sarcopenia refers to the degeneration of skeletal muscle mass, quality and strength as part of normal aging; not associated with a disease process. Contributing factors include age-related decrease in neuromuscular impulses, decreased physical activity, decrease in hormones that support muscle mass (testosterone), and decreased ability to synthesize muscle proteins combined with inadequate protein nutrition to sustain muscle

mass. Sarcopenia may be difficult to identify because total weight may not change; loss of lean body mass may be accompanied by increase in adipose tissue mass.[15,16]

Nutritional Assessment & Evaluation

Nutritional assessments provide vital information about the patient's diet and feeding management that aids the veterinary healthcare team in assessing the adequacy of nutrient intake, the suitability of feeding practices, and whether any dietary modification is indicated. A nutritional assessment should be performed on every cat that comes into the hospital, every time they come into the hospital. If a patient is hospitalized, continual monitoring of weight and nutritional status is critical and must be consistently checked by the veterinary team. An in-depth nutritional history gives an indication of the foods that the patient routinely consumes as well as any nutritional risk factors exhibited by the patient or presented by the patient's diet, feeding management, or environment. Preferably, the person who is most responsible for feeding the patient should be questioned; however, it is important to find out who else resides in the household or has regular contact with the cat, including other pets. The history should also include information regarding appetite, any changes in body weight, or composition (BCS/MCS),, level of physical activity, and occurrence of any GI signs. If changes are mentioned, the time frame over which changes have occurred must be documented.

On initial assessment, the focus is directed at obtaining a thorough history and completing a physical exam. Body composition assessment including evaluation of body condition, muscle condition, and body weight are essential and should be performed in every patient. Evaluating trends in these parameters over time will help to recognize changes early. Early intervention may allow for improved patient outcomes.

A complete nutritional history should determine the quality and adequacy of the food being fed to the pet, the feeding protocol (e.g., meal fed, free choice, amount, family member responsible for feeding the pet), and a history of the types of food fed to the pet, and any other sources of energy intake (no matter how small or seemingly unimportant).[18]

It is best to ask open ended questions to not put the client on the defensive. A great way to get more information about what goes into the pet, is to ask the client to write down everything that needs to be done for the pet if the owner was going on vacation. This garners a lot of information that typical closed ended questioning will not. [18]

Using a problem-oriented approach can be valuable when evaluating cats with unintentional weight loss. The problem list is generated based on the results of the nutritional history and physical exam. There are a wide variety of diseases that can result in weight loss.

Differentiating cachexia from sarcopenia is important and may require a thorough diagnostic investigation. Once the diagnostic evaluation is underway, management for unintentional weight loss can begin.

Management Approaches

The approach for managing feline patients experiencing unintentional weight loss must be patient specific. Management and support are multi-modal and should be tailored to the individual patient based on the suspected underlying cause for weight loss. Various therapeutic and supportive strategies exist.

Some patients will require assisted feeding in the form of feeding tubes, which can be used for both in hospital and outpatient support. The use of intravenous nutrition may be considered for the critically ill feline patient on a case by case basis.[3] Dietary manipulation including altering flavor, kibble shape, texture, or moisture content of the diet can be attempted.

Whether the patient is receiving medications that could suppress appetite should be considered. Medications that may lead to anorexia in the cat include; antibiotics, non-steroidal anti-inflammatory drugs, narcotics, chemotherapeutic agents, and cardiac glycosides. Attempts at modifying the environment may include; moving feeding areas, segregating cats during feeding, and free choice feeding. In addition, pharmacologic support (i.e., mirtazapine) to promote weight gain should be considered.

Mirtazapine

Mirataz® (mirtazapine transdermal ointment) is the first FDA-approved transdermal medication available for cats and acts as a weight gain drug. The pharmacodynamic action of mirtazapine involves antagonism of several receptor sites. Antagonism of presynaptic α-2 receptors, serotonin receptors (5-HT2A, 5-HT2C, 5-HT3), and histamine receptors (H1) by mirtazapine has been demonstrated to result in[4]:

- Orexigenic effect via interaction with 5-HT2 receptors
- Enhanced release of both serotonin (5-HT) and noradrenaline (NE)

Mirataz demonstrated a 3.9% increase in body weight in cats with unintended weight loss in as little as 14 days.[19] Mirataz is indicated for the management of weight loss in cats.

Veterinary technicians play an important role in assisting the veterinarian and the client with identification of the underlying causes of weight loss in the patient. A recent study which analyzed patient records of more than 2,600 cats showed a body condition score (BCS) of 6 had the highest survival rate. Lifespan decreased when cats had a BCS less than 5 out of 9. Thus, helping clients maintain their cat's ideal body condition helps improve their pet's lifespan and quality of life.[20]

The consequences of malnutrition in cats are decreased immunocompetence, decreased tissue synthesis and repair, and altered drug metabolism. Nutritional management in cats with weight loss requires constant monitoring and careful calculations by the veterinary technician to address the malnutrition. Constant vigilance and exceptional nursing care will help the patient to manage their malnutrition and facilitate healing and recovery.

Ultimately, it is important to remember that prolonged inadequate nutrition may be more detrimental to the patient than the primary disease process itself.[4]

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