

Energy Restriction & Nutrient Deficiency in Cats

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In the literature

Grant CE, Shoveller AK, Blois S, Bakovic M, Monteith G, Verbrugghe A. Dietary intake of amino acids and vitamins compared to NRC requirements in obese cats undergoing energy restriction for weight loss. *BMC Vet Res.* 2020;16(1):426.

FROM THE PAGE ...

Obesity is an ongoing concern affecting companion animals. Adipose tissue was once erroneously characterized as metabolically inactive, but it produces hormones and proteins that influence metabolism. Creating a weight-loss plan to manage obesity can be challenging, and several factors should be considered, including ensuring the patient is receiving adequate nutrition when calories are restricted.

In this study, cats were divided into a lean ($n = 14$) or obese ($n = 16$) group based on BCS. Both groups were fed a therapeutic weight-loss diet over a 4-week period. To encourage weight loss, the obese group was fed the same diet but with fewer calories (60% of their calculated resting energy requirement) for an additional 10 weeks. Cats tolerated the diet and demonstrated no clinical signs of nutrient deficiencies. Although dietary intake for crude protein was above the National Research Council's minimum requirement for cats in both groups, inadequate dietary intake of arginine occurred in 4 cats in the lean group and all 16 cats in the obese group. In addition, dietary intake of choline was inadequate in one cat in the lean group and all 16 cats in the obese group. However, all intakes were compared with the requirements based on ideal body weight versus the patient's current weight.

Arginine is an essential amino acid that serves as an important intermediate in the urea cycle, which is vital for the normal metabolism of protein. Arginine deficiency can result in hyperammonemia and clinical signs (eg, lethargy, ataxia, vocalization); in severe cases, death can occur. Choline is important in lipid metabolism; deficiency can result in increased fat accumulation in the liver due to impaired fat transport.

Restricting calorie intake is important in weight management; however, it is also important to select diets that provide adequate nutrients. Although feeding a therapeutic diet formulated specifically for weight management is generally recommended to avoid such deficiencies, this study demonstrates that even a therapeutic weight-management diet may result in deficiencies when fed at 60% of the calculated resting energy requirement.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1 Therapeutic weight-management diets are formulated to be higher in nutrients and lower in calories to avoid nutrient deficiencies. However, when cats are fed an amount below the manufacturer's guidelines, nutrient deficiencies can occur.
- 2 Clinicians can calculate protein requirements based on the National Research Council's recommended allowance (cats, $4.96 \times [\text{body weight in kg}]^{0.67}$; dogs, $3.28 \times [\text{body weight in kg}]^{0.75}$) and compare this amount with the dietary protein intake to screen for possible dietary protein inadequacy.
- 3 For patients being fed $\leq 60\%$ of their resting energy requirement, the manufacturer's typical analysis to determine nutrient intake can help identify the risk for malnutrition.

Research Note: Ultrasonographic Peripheral Band & Suspected Lung Lobe Torsion

This multicenter, observational study assessed the presence, distribution, and appearance of specific ultrasonographic features in dogs with lung lobe torsion. Of the 15 dogs in the study, 14 had a hypoechoic, peripheral band extending along the edge of the affected lung lobe with overlying areas of scattered hyperreflecting interfaces; these features were not observed in a single dog with an entirely consolidated lung lobe. Findings were then compared against CT and histologic features. CT findings included central emphysema surrounded by a peripheral, soft tissue attenuation band in 14 dogs; no band was noted in the dog with complete lung consolidation. Histologic examination revealed a comparable band consisting of thickened pleura. The authors concluded that an ultrasonographic peripheral hypoechoic band associated with central emphysema in a noncollapsed lung lobe suggests compromised blood supply and air flow, and lung lobe torsion should therefore be suspected.

Source

Belmudes A, Gory G, Cauvin E, et al. Lung lobe torsion in 15 dogs: peripheral band sign on ultrasound. *Vet Radiol Ultrasound*. 2021;62(1):116-125.