

“Obesity is the essence of fatness” A feline perspective

Alison Jukes BVSc (hons) FANZCVS (feline medicine)

Cat Specialist Services, Underwood, drjukes@catspecialists.com.au

Keywords: feline, overweight, obesity, risk factors, management

What is obesity?

According to a recent expert consensus in the Lancet, obesity in people is considered “A condition characterised by excess adiposity with or without abnormal distribution or function of adipose tissue”.¹ Interestingly in humans obesity is considered preclinical or clinical according to the presence or absence of concurrent disease or ill health however patients with preclinical obesity are known to be at increased risk of developing clinical obesity.¹ From the veterinary perspective, in an opinion piece from The Veterinary Record (2025) by Drs Alexander German, Georgiana Woods, Ernie Ward and Julie Churchill², these veterinarians advocate that the veterinary profession adopt a similar definition in companion animals with the obesity phenotype based on body condition score (BCS) 8-9/9.

Proposed diagnostic criteria for clinical and preclinical obesity veterinary patients is excess adiposity is classified as BCS 8-9/9 with $\geq 30\%$ increase in bodyweight in adulthood and direct measures of body fat (eg dexa scan, body fat index). The difference between clinical and preclinical diagnosis is based on evidence of direct dysfunction relatable to organ systems with the caveat of age-adjusted limitations on quality of life, mobility or other daily aspects of the patients life.² Other sources have suggested that patients 10-20% over ideal body weight are considered overweight while patients that are $>20\%$ over ideal body weight are considered obese.³

The prevalence of overweight and obese cats is high and is estimated to between 11-63% of cats⁴⁻⁷ and varies according to geographic location. The cost of obesity in pets to owners is large. A Banfield survey found that the owners of overweight dogs spent 17% more on health care and 25% more on medications compared to owners with healthy weight dogs. Owners of overweight cats spend 36% more on diagnostic procedures and 53% more on surgical procedures compared to owners of healthy weight cats.⁶

Body condition score was developed as a semi-quantitative measure of adiposity in cats and dogs. There are limitations to the accuracy of this scale in its clinical use. Additionally “ideal” body condition score for practical lifetime outcomes for cats such as life expectancy has not been validated. There are two BCS systems; 1-5 and 1-9 with ideal body conditions considered 3/5 and 5/9. Both scoring systems have been shown to correlate increasing percentage body fat to increasing BCS with dual-energy x-ray absorptiometry (DEXA).^{8,9} However given the subjective nature of assigning BCS there is interindividual variation between scoring.^{9,10} Computed tomography has been used to quantify levels of visceral fat and Okada et al found BCS does not always reflect levels of visceral fat in overweight and

obese cats.¹¹ A lifetime labrador study found that dogs fed less and maintained in a lean BCS lived significantly longer with less morbidity than their overweight counterparts.¹² An equivalent feline study has not been performed.

Physiologic changes occur in overweight and obese cats and likely play a role in the development of obesity associated disease. This includes changes in various cytokines and hormones including adipokines (increased leptin and decreased adiponectin), insulin like growth factor-1 (IGF-1), increased triglycerides and serum amyloid A.^{11,13} Leptin is correlated with increasing adiposity in cats and is thought to be pro-inflammatory and is associated with increasing insulin resistance.¹⁰ Adiponectin is insulin sensitising and anti-inflammatory and it is decreased in human obesity but the relationship between adiponectin levels and obesity is less clear in cats.^{10,14} While obesity results in low grade inflammation in humans and rodents, this is not as clear cut in cats and may be related to intrinsic differences in metabolism between species.¹⁴

Human medicine has identified metabolically healthy obese individuals as distinct from metabolically unhealthy obese individuals based on biochemical markers such as plasma triglycerides, insulin sensitivity and association with disease such as type 2 diabetes mellitus and coronary artery disease.¹⁵ However, metabolically healthy individuals have still been shown to be at increased risk of cardiometabolic disease compared to metabolically healthy weight individuals.^{1,15}

There has been limited research in feline medicine to differentiate metabolically healthy obese (MHO) vs metabolically unhealthy obese (MUO) cats. A recent study by Okada et al has attempted to define these states and found MHO cats with high levels of adiponectin, normal triglycerides and serum amyloid A (SAA) compared to MUO cats that had low levels of adiponectin, high levels of triglycerides and high SAA.¹¹

Risk factors for obesity in cats are varied and include middle age, indoor confinement and reduced energy expenditure, dry food diet, premium foods (calorie dense), male sex and fat content of the diet.¹⁶ However, the biggest risk factor for obesity is neutering - entire cats are rarely overweight. Gonadectomy is reported to result in reduced energy requirements up to 30% in adult cats¹⁷ with corresponding increase in energy intake by up to 50%.¹⁸ The rate of weight gain when young increases likelihood of being overweight when older with cats that are overweight at one year of age have an increased risk of developing obesity in middle age.¹⁹

Feeding predominantly dry food diets has been implicated in obesity across a number of studies.²⁰⁻²² Macronutrient content of cat diets has been studied to investigate the role of high versus low carbohydrate, fat and protein in commercial foods and its role in weight gain in cats. Commercial foods tend to have a higher carbohydrate content compared to prey diets.¹³ Overall high dietary fat and overfeeding seems to be implicated in the highest levels of weight gain in cats, rather than carbohydrate and protein.¹³ Owners attitudes to their cats and degree of attachment have been found to be associated with overweight and obesity^{22,23} and owners of overweight cats have a tendency to underestimate their BCS.¹³

Cats that are overweight or obese are at increased risk of a range of disease processes including skin disease, lower urinary tract disease, ophthalmic disease, gastrointestinal disease, orthopaedic disease,¹⁰ hepatic lipidosis, cardio-respiratory disease, insulin resistance and type 2 diabetes mellitus and neoplastic disease.^{20,24,25} Increased mortality is associated with severe obesity in cats^{26,27} and in overweight dogs.²⁸ Interestingly however evidence seems to suggest that slightly overweight cats (BCS 6/9 and BCS 4/5) live the longest.^{26,27} In contrast, a VetCompass study from England found that cats with lower bodyweight was associated with increased longevity though this study did not assess BCS.²⁹

Prevention of overweight and obesity needs to be considered the foundation in maintaining feline patients at a healthy weight. The evidence presented has shown that many risk factors for overweight and obesity are lifestyle dependent including diet and composition (wet vs dry), activity levels and indoor status, environmental stressors from cohabiting cats, perceptions of obesity in cats by the owner and level of owner attachment. There is a link between inactivity and weight gain in cats <12 months old translating to overweight and obesity in older age therefore discussion around maintenance of weight starts at kitten vaccinations.³⁰ Many patients may be seen for their final vaccination at 16 weeks then not again until they are 16-18 months old for their next vaccination. An additional health check at 12 months to assess weight and body condition in pet cats may be beneficial. Educating owners on how to assess body condition and muscle condition in their pet cats as well as giving owners practical methods for managing diet and exercise over the patient's life. Additionally, consider transition off energy dense kitten foods once most of their growing is finished (9-10 months old rather than 12 months old). Owners have been found to be more motivated for prevention and management of obesity in pet cats if they are aware of negative impact on life expectancy.³¹

Practical methods of managing overweight and obese patients include addressing:

1. Effective and consistent veterinary (all staff) and owner communication regarding prevention and management of obesity
2. Diet: consider transition to exclusively wet food, lower calorie density and impact on satiety, using kitchen scales to measure portions
3. Method of feeding: small frequent meals more mentally stimulating for the average cat and closer mimic of prey diet, consider the use of food puzzles to slow feeding down, hiding food around the house (environmental enrichment) and may increase exercise/activity levels
4. Increase movement: use vertical space such as cat trees, hammocks or shelves, increase human/cat interactions and play time. These will both improve enrichment for the patient and will help to encourage movement/exercise.
5. Monitoring of weight loss: weight in clinic (stress?) vs owner purchase baby scales, nurse managed weight clinics to encourage owners to keep on track
6. Don't try to diet mildly overweight (BCS 6/9) cats once middle aged: mild increase in condition may improve longevity

References

1. Rubino F, Cummings DE, Eckel RH et al. Definition and diagnostic criteria of clinical obesity. *Lancet Diabetes Endocrinol* 2025;13:221–262.
2. German AJ, Woods G, Ward E et al. “We should adopt new definitions for clinical obesity in companion animals.” *Vet Rec* 2025;196:197–198.
3. Michel K, Scherk M. From Problem to Success. *J Feline Med Surg* 2012;14:327–336.
4. Cave NJ, Allan FJ, Schokkenbroek SL et al. A cross-sectional study to compare changes in the prevalence and risk factors for feline obesity between 1993 and 2007 in New Zealand. *Prev Vet Med* 2012;107:121–133.
5. Courcier EA, Mellor DJ, Pendlebury E et al. An investigation into the epidemiology of feline obesity in Great Britain: results of a cross-sectional study of 47 companion animal practises. *Vet Rec* 2012;171:560.
6. Banfield finds 1 in 3 dogs and cats is overweight | American Veterinary Medical Association. 2017. <https://www.avma.org/javma-news/2017-08-01/banfield-finds-1-3-dogs-and-cats-overweight>. Retrieved May 13 2025.
7. Teng KT, McGreevy PD, Toribio J-ALML et al. Risk factors for underweight and overweight in cats in metropolitan Sydney, Australia. *Prev Vet Med* 2017;144:102–111.
8. Bjornvad CR, Nielsen DH, Armstrong PJ et al. Evaluation of a nine-point body condition scoring system in physically inactive pet cats. *Am J Vet Res* 2011;72:433–437.
9. Shoveller AK, DiGennaro J, Lanman C et al. Trained vs untrained evaluator assessment of body condition score as a predictor of percent body fat in adult cats. *J Feline Med Surg* 2014;16:957–965.
10. Ley CJ, M Strage E, Stadig SM et al. Associations between body composition, metabolic mediators and osteoarthritis in cats. *BMC Vet Res* 2025;21:103.
11. Okada Y, Ueno H, Mizorogi T et al. Diagnostic Criteria for Obesity Disease in Cats. *Front Vet Sci* 2019;6:284.
12. Kealy RD, Lawler DF, Ballam JM et al. Effects of diet restriction on life span and age-related changes in dogs. *J Am Vet Med Assoc* American Veterinary Medical Association, 2002;220:1315–1320.
13. Saavedra C, Pérez C, Oyarzún C et al. Overweight and obesity in domestic cats: epidemiological risk factors and associated pathologies. *J Feline Med Surg* 2024;26:1098612X241285519.
14. Stenberg K, Novotny GW, Lutz TA et al. Obesity-induced changes in gene expression in feline adipose and skeletal muscle tissue. *J Anim Physiol Anim Nutr* 2023;107:1262–1278.

15. Tanriover C, Copur S, Gaipov A et al. Metabolically healthy obesity: Misleading phrase or healthy phenotype? *Eur J Intern Med* 2023;111:5–20.
16. Mizorogi T, Kobayashi M, Ohara K et al. Effects of Age on Inflammatory Profiles and Nutrition/Energy Metabolism in Domestic Cats. *Vet Med Auckl NZ* 2020;11:131–137.
17. Martin L, Siliart B, Dumon H et al. Leptin, body fat content and energy expenditure in intact and gonadectomized adult cats: a preliminary study. *J Anim Physiol Anim Nutr* 2001;85:195–199.
18. Backus RC, Cave NJ, Keisler DH. Gonadectomy and high dietary fat but not high dietary carbohydrate induce gains in body weight and fat of domestic cats. *Br J Nutr* 2007;98:641–650.
19. Serisier S, Feugier A, Venet C et al. Faster growth rate in ad libitum-fed cats: a risk factor predicting the likelihood of becoming overweight during adulthood. *J Nutr Sci* 2013;2:e11.
20. Öhlund M, Palmgren M, Holst BS. Overweight in adult cats: a cross-sectional study. *Acta Vet Scand* 2018;60:5.
21. Rowe E, Browne W, Casey R et al. Risk factors identified for owner-reported feline obesity at around one year of age: Dry diet and indoor lifestyle. *Prev Vet Med* 2015;121:273–281.
22. Wall M, Cave NJ, Vallee E. Owner and Cat-Related Risk Factors for Feline Overweight or Obesity. *Front Vet Sci* 2019;6:266.
23. Teng KT, McGreevy PD, Toribio J-ALML et al. Positive attitudes towards feline obesity are strongly associated with ownership of obese cats. *PLoS One* 2020;15:e0234190.
24. Teng KT, McGreevy PD, Toribio J a. LML et al. Associations of body condition score with health conditions related to overweight and obesity in cats. *J Small Anim Pract* 2018;
25. Lund EM, Armstrong PJ, Kirk CA, Klausner, JS. Prevalence and risk factors for obesity in adult cats from private US veterinary practices. *Int J Appl Res Vet Med* 2005;3:88–96.
26. Montoya M, Morrison JA, Arrignon F et al. Life expectancy tables for dogs and cats derived from clinical data. *Front Vet Sci* *Frontiers*, 2023;10.
<https://www.frontiersin.org/journals/veterinary-science/articles/10.3389/fvets.2023.1082102/full>.
27. Teng KT, McGreevy PD, Toribio J-AL et al. Strong associations of nine-point body condition scoring with survival and lifespan in cats. *J Feline Med Surg* 2018;20:1110–1118.
28. Salt C, Morris PJ, Wilson D et al. Association between life span and body condition in neutered client-owned dogs. *J Vet Intern Med* 2019;33:89–99.

29. O'Neill DG, Church DB, McGreevy PD et al. Longevity and mortality of cats attending primary care veterinary practices in England. *J Feline Med Surg* 2015;17:125–133.
30. Godfrey H, Morrow S, Abood SK et al. Identifying the target population and preventive strategies to combat feline obesity. *J Feline Med Surg* 2024;26:1098612X241228042.
31. Sutherland KA, Coe JB, Groves CNH et al. Information about life expectancy related to obesity is most important to cat owners when deciding whether to act on a veterinarian's weight loss recommendation. *J Am Vet Med Assoc American Veterinary Medical Association*, 2024;262:798–807.