

# OBESITY IN COMPANION ANIMALS

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**TIM WATSON** discusses the increasing occurrence of weight gain among pets, as well as its causes, health consequences and methods of management

**IT is estimated 40 per cent of dogs and cats in developed countries are overweight or obese, and there are fears that rabbits may be similarly affected by this epidemic. The scale of the problem is reflected in substantial research published in the past three years, which has focused on four areas – prevalence of obesity, contributing or causal factors, consequences for animal health and strategies for successful weight management.**

## Prevalence of obesity

Surveys conducted in Paris<sup>1</sup> and Glasgow<sup>2</sup> revealed 27 per cent and 39 per cent of cats, respectively, were overweight or obese. A third study examined how the prevalence of feline obesity in New Zealand had changed between 1993 and 2007<sup>3</sup>.

Also, contrary to what may have been anticipated, there was little change in the intervening 14 years, with 27 per cent having a body condition score (BCS) of greater than six out of nine in 2007, compared with 26 per cent in 1993.

Obesity has anecdotally been cited as an issue in pet rabbits ([Figure 1](#)) and first data on its prevalence and risk factors have emerged. In a survey of 41 UK veterinary practices, Courcier et al found eight per cent were overweight and none defined as obese, according to their BCS<sup>4</sup>.

In common with dogs and cats, neutered rabbits were at substantially greater risk – 5.4 times more

likely – of being overweight than sexually intact counterparts.

## Contributing or causal factors

So, why does obesity persist in being so prevalent, despite efforts to educate both the veterinary profession and the pet-owning public? One reason is owners continue to underestimate their animal's body condition. This was found to be a significant determinant of risk of obesity in cats in the New Zealand study<sup>3</sup>, with failure to appreciate what is normal or ideal body condition cited as a reason for weight gain in rabbits<sup>5</sup>.

When owners' perception of dog weight was compared with veterinary opinion, disagreement was greater for overweight dogs<sup>6</sup>. It was also found that owners often provide personal narratives to account for their dog's weight, reflecting the fact that excuses and resignation are often barriers to weight management. Failure to control meal sizes – either through offering free access to food or overestimating portions – undoubtedly contributes to obesity, since many dogs and cats appear unable to self-regulate their energy intake.

Accurately calculating maintenance energy requirements (MER) is essential for determining food allowances and avoiding overconsumption of calories. Recommended MER – that is, for ideal or stable bodyweight – for pet dogs vary between 95kcal/kg<sup>0.75</sup> and 133kcal/kg<sup>0.75</sup>, but it has long been felt these overestimate requirements in dogs prone to weight gain. This was borne out by findings from obese dogs that had successfully completed a weight management programme at the University of Liverpool, with 68kcal/kg<sup>0.75</sup> the average MER during a period of stable bodyweight<sup>7</sup>.

A similar trend emerged from meta-analysis of 42 published reports of feline energy requirements<sup>8</sup>, which suggested average MER of 56kcal/kg, compared with the value of 70kcal/kg previously recommended by expert bodies. The authors went further in identifying that calorie allowances were substantially lower in heavy (44kcal/kg) than normal (56kcal/kg) and light (63kcal/kg) weight cats.

These data highlight the potential for overconsumption of calories – even when energy requirements are calculated or feeding guides are followed. In dogs prone to obesity, even when using the lowest estimate of MER there may be a 40 per cent overestimate of allowances. Similarly, the previous recommendation for cats will overestimate calorie intake of heavy cats by 37 per cent.

## Health consequences

Another factor contributing to the obesity epidemic is failure of owners to fully appreciate how it affects the health and welfare of their pets. While many remain oblivious or choose to ignore the facts, we as a profession might do more. Perhaps we haven't made the most of the compelling argument that laboratory dogs that weigh less and have lower body fat content – achieved by

lifelong calorie restriction – live longer, with delayed onset of chronic disease<sup>9</sup>.

A message that should resonate louder with pet owners comes from recent research that quantified quality of life in client-owned dogs. Here, weight loss led to increased vitality, which was correlated with percentage weight loss and, specifically, the amount of body fat loss, as well as decreased scores for both emotional disturbance and pain<sup>10</sup>. Conversely, dogs that failed to lose weight had lower vitality and higher emotional disturbance scores than those successfully losing weight.

Further inducement should come from recent studies that have delved into health consequences of obesity, looking beyond the usually cited examples of musculoskeletal disease in dogs and diabetes mellitus in cats to heart and renal disease, metabolic alterations and inflammatory conditions. These have shown that weight gain and obesity are associated with left ventricular hypertrophy and diastolic dysfunction in dogs<sup>11</sup>, which reverse with weight loss<sup>12</sup>.

In rabbits, obesity is accompanied by the development of hypertension and tachycardia<sup>13</sup>. Subclinical alterations in renal function also occur in canine obesity and again improve with weight loss<sup>14</sup>. Thus, obesity may represent a risk for impaired renal function and be a factor in its management.

Approximately 20 per cent of obese dogs have been found to suffer metabolic syndrome associated with the development of insulin resistance, dyslipidaemia and mild hypertension<sup>15</sup>. Systolic blood pressure, plasma lipids and fasting insulin all decreased after weight loss.

There is increasing evidence in humans that obesity is associated with induction of inflammatory complications. This also appears to be true in pets, with research showing that feline obesity is characterised by alterations in adipocyte gene expression that favour pro-inflammatory cytokines and chemokines<sup>16</sup>.

## Successful weight management strategies

The final strand of research has looked at strategies for successful weight management. Dietary measures – notably calorie control – continue to be the mainstay, along with efforts to increase energy expenditure through exercise. Importance of the latter, especially in dogs, is borne out by the fact that BCS is inversely correlated with average daily steps<sup>17</sup>.

Using pedometers that had been validated on both medium and large-breed dogs, scientists at Cornell University found daily step counts ranged from just more than 5,000 to nearly 40,000. From a practical perspective, pedometers ([Figure 2](#)) could provide owners with an accurate means of measuring their dog's exercise, plugging data into a weight loss programme that allows the whole family to monitor and celebrate their efforts in increasing the pet's activity and overcoming obesity.

## References

- 1. Colliard L, Paragon B M, Lemuet B, Bénét J J and Blanchard G (2009). Prevalence and risk factors of obesity in an urban population of healthy cats, *Journal of Feline Medicine and Surgery* **11**(2): 135-140.
- 2. Courcier E A, O'Higgins R, Mellor D J and Yam P S (2010). Prevalence and risk factors for feline obesity in a first opinion practice in Glasgow, Scotland, *Journal of Feline Medicine and Surgery* **12**(10): 746-753.
- 3. Cave N J, Allan F J, Schokkenbroek S L, Metekohy C A and Pfeiffer D U (2012). A cross-sectional study to compare changes in the prevalence and risk factors for feline obesity between 1993 and 2007 in New Zealand, *Preventative Veterinary Medicine* **107**(1-2): 121-133.
- 4. Courcier E A, Mellor D J, Pendlebury E, Evans C and Yam P S (2012). Preliminary investigation to establish prevalence and risk factors for being overweight in pet rabbits in Great Britain, *Veterinary Record* **171**(8): 197.
- 5. Meredith A (2012). Is obesity a problem in pet rabbits? *Veterinary Record* **171**(8): 192-193.
- 6. White G A, Hobson-West P, Cobb K, Hammond R and Millar K M (2011). Canine obesity: is there a difference between veterinarian and owner perception? *Journal of Small Animal Practice* **52**(12): 622-626.
- 7. German A J, Holden S L, Mather N J, Morris P J and Biourge V (2011). Low-maintenance energy requirements of obese dogs after weight loss, *British Journal of Nutrition* **106** Suppl 1: S93-S96.
- 8. Bermingham E N, Thomas D G, Morris P J and Hawthorne A J (2010). Energy requirements of adult cats, *British Journal of Nutrition* **103**(8): 1,083-1,093.
- 9. Kealy R D, Lawler D F, Ballam J M, Mantz S L, Biery D N, Greeley E H, Lust G, Segre M, Smith G K and Stowe H D (2002). Effects of diet restriction on life span and age-related changes in dogs, *Journal of the American Veterinary Medical Association* **220**(9): 1,315-1,320.
- 10. German A J, Holden S L, Wiseman-Orr M L, Reid J, Nolan A M, Biourge V, Morris P J and Scott E M (2012). Quality of life is reduced in obese dogs but improves after successful weight loss, *The Veterinary Journal* **192**(3): 428-434.
- 11. Mehlman E, Bright J M, Jeckel K, Porsche C, Veeramachaneni D N and Frye M (2013). Echocardiographic evidence of left ventricular hypertrophy in obese dogs, *Journal of Veterinary Internal Medicine* **27**(1): 62-68.
- 12. Pelosi A, Rosenstein D, Abood S K and Olivier B N (2013). Cardiac effect of short-term experimental weight gain and loss in dogs, *Veterinary Record* **172**(6): 153.
- 13. Eppel G A, Armitage J A, Eikelis N, Head G A and Evans R G (2013). Progression of cardiovascular and endocrine dysfunction in a rabbit model of obesity, *Hypertension Research* **36**(7): 588-595.
- 14. Tvarijonaviciute A, Ceron J J, Holden S L, Biourge V, Morris P J and German A J (2013). Effect of weight loss in obese dogs on indicators of renal function or disease, *Journal of Veterinary Internal Medicine* **27**(1): 31-38.
- 15. Tvarijonaviciute A, Ceron J J, Holden S L, Cuthbertson D J, Biourge V, Morris P J and

- German A J (2013). Obesity-related metabolic dysfunction in dogs: a comparison with human metabolic syndrome, *BMC Veterinary Research* **8**: 147.
- 16. Van de Helde H, Janssens G P, de Rooster H, Polis I, Peters I, Ducatelle R, Nguyen P, Buyse J, Rochus K, Xu J, Verbrugghe A and Hesta M (2013). The cat as a model for human obesity: insights into depot-specific inflammation associated with feline obesity, *British Journal of Nutrition* **23**: 1-10 [Epub ahead of print].
  - 17. Warren B S, Wakshlag J J, Maley M, Farrell T J, Struble A M, Panasevich M R, Wells M T (2011). Use of pedometers to measure the relationship of dog walking to body condition score in obese and non-obese dogs, *British Journal of Nutrition* **106** Suppl 1: S85-S89.



**Figure 1.** In a survey of 157 rabbits presented to UK veterinary practices, eight per cent were

*found to be overweight<sup>4</sup>.*



***Figure 2. Pedometers can help monitor activity levels and encourage owners to increase their dog's exercise.***