A Clinical Investigation on the Impact of Nutritional Calculations in Hospitalised Canine and Feline Patients

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Abstract

Nutritional provision is vital for hospitalised patients but often overlooked, despite being considered the fifth vital sign. This study evaluated whether calculating resting energy requirements (RER) reduced the occurrence of weight changes in hospitalised dogs and cats. Retrospective and prospective data on body weight, body condition score (BCS), and RER were analysed. In the retrospective study, a significant difference was found between admission and discharge weights (P=0.014), while no significant difference was seen in the prospective study (P=0.572). Patients without RER calculations lost more weight than those with RER calculated (P=0.005). These findings suggest that incorporating nutritional calculations into hospital protocols may help prevent unintended weight changes in hospitalised patients.

Introduction

Nutritional management is a key aspect of veterinary care, especially in hospitalised patients where diet influences recovery and outcomes (Burney et al., 2025). Hospitalisation often causes metabolic stress, reduced intake, and weight loss, which can affect prognosis (Freeman et al., 2013). Malnutrition may result from illness, increased metabolic demands, or inadequate feeding strategies (Gajanayake, 2022). In human medicine, early nutritional support improves outcomes and recovery (Jiang et al., 2025), and similar benefits are suggested in veterinary patients (Chan, 2009). However, the impact of standardised nutritional calculations on weight maintenance in hospitalised veterinary patients remains poorly researched.

RER calculations provide an objective way to guide feeding (NRC, 2006), yet are often overlooked, leading to under- or overfeeding (Johnson & Freeman, 2017). Monitoring body weight and BCS is recognised as important (Murphy, Stevenson & Mansfield, 2023), but the effect of routine RER calculations on weight maintenance during hospitalisation remains underexplored.
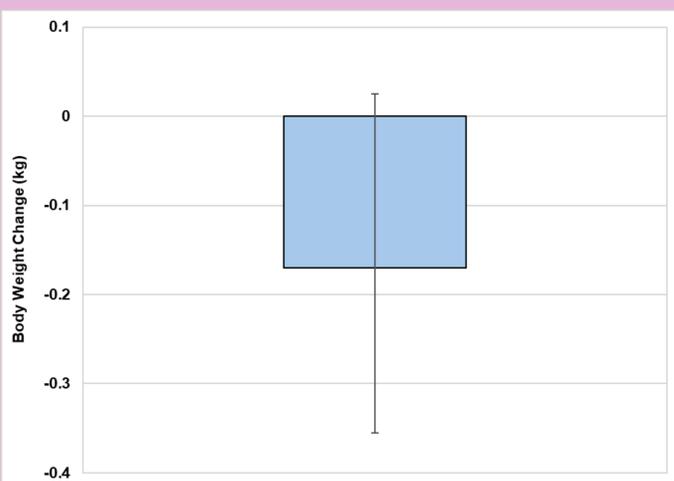
Objective

The objective of this research was to quantify the impact of nutritional calculations on hospitalised canine and felines and to assess whether calculating RER reduced the risk of weight change during hospitalisation.

Materials and Methods

This observational study assessed the impact of nutritional calculations in hospitalised dogs and cats at a first-opinion practice over six months (February–July 2024). Data collection included a retrospective review of 28 patients (no RER recorded) and a prospective study of 27 patients (with RER calculated). Eligible patients were hospitalised ≥24 hours, offered Royal Canin diets, and had complete records. Exclusions included hyperthyroidism, bowel disease, neonates, or non-standard diets.

RER was calculated using standard formulas: (30 × body weight [kg]) + 70 for patients weighing 2–30 kg, or 70 × (body weight [kg]^0.75) for patients weighing <2 kg or >30 kg. Body weight (kg) and BCS, (Royal Canin 9-point chart) were recorded; food and water intake were assessed visually. Weights were measured digitally, and RER was recalculated every two days by the nursing team.

Ethical approval was obtained, with GDPR compliance and anonymised data storage. Statistical analysis used the Wilcoxon test to compare admission and discharge weights, and Mann–Whitney U to compare retrospective and prospective groups.

Figure 1. Median body weight change during hospitalisation (retrospective) (error bars indicate interquartile range)
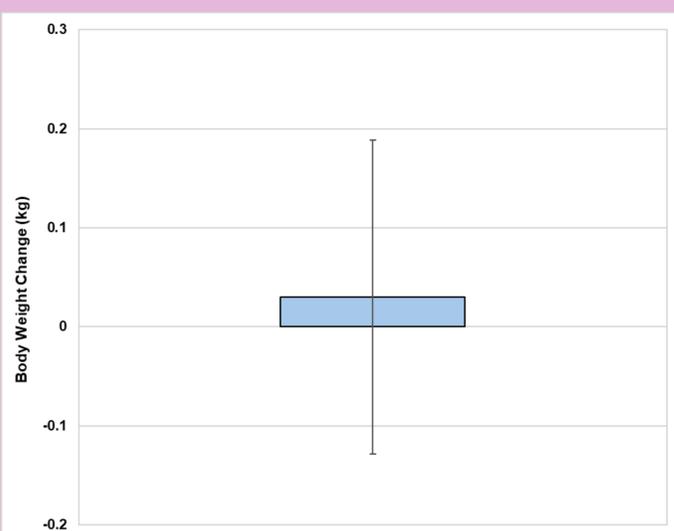

Figure 2. Mean body weight change during hospitalisation (prospective) (error bars indicate standard deviation)

Results

- Retrospective study: Significant weight loss from admission to discharge (median 5.65 kg → 5.34 kg, P=0.014).

- Prospective study: No significant weight change (12.30 kg → 12.10 kg, P=0.572).

- RER calculations: Patients without RER lost more weight (−0.17 kg) (see Figure 1) than those with RER calculated (+0.03 kg) (see Figure 2) (P=0.005).

- Hospitalisation length: No association with weight change in either study, but hospitalisation was shorter in the prospective group (2 vs 3 days, P<0.001), suggesting a potential link between the provision of nutritional support and the duration of hospitalisation.

- Species differences: No significant difference in weight change between canines and felines in either the retrospective (P=0.353, U=70.5) or prospective (P=0.109, U=44.5) studies.

- BCS differences: Retrospective study showed no significant difference in body weight change (%) between the three BCS groups (ideal (4-5), underweight (1-3), overweight (6-9)) (P=0.147). In the prospective study, underweight patients lost significantly more weight than those in ideal condition (P=0.042).

Discussion and Conclusion

This study demonstrated that hospitalised dogs and cats without RER calculations experienced significant weight loss, whereas those with calculated RER maintained stable body weights. These results suggest that individualised nutritional calculations can help prevent unintended weight loss during hospitalisation and should be considered a routine part of inpatient care. This aligns with existing literature emphasising the importance of energy balance in supporting recovery from illness or surgery. Weight loss in hospitalised patients is likely influenced by reduced appetite, stress, or post-surgical recovery, further underlining the value of proactive nutritional support.

Although hospitalisation length did not directly correlate with weight change, admissions were shorter in the prospective cohort, raising the possibility that nutritional intervention may indirectly influence recovery time. However, other factors such as case severity and treatment differences may also contribute and warrant further investigation. Species-based comparisons showed no significant differences, indicating that the benefits of nutritional calculations are broadly applicable across dogs and cats. Notably, underweight patients in the prospective cohort were more prone to weight fluctuations, highlighting the importance of targeted monitoring and support in this group.

Study limitations include the modest sample size, which reduces statistical power and generalisability, as well as potential variability in disease type, severity, and feeding compliance. Future research should examine larger populations and control for these variables to better assess the impact of nutritional calculations on clinical outcomes, recovery time, and overall patient wellbeing.

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