**What is the best method of estimating energy intake for weight loss in obese dogs?**

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The main therapeutic approach for canine obesity is restricting caloric intake, and this succeeds provided that the energy intake (EI) during weight loss is less than the dog’s energy expenditure. Many methods exist for predicting the starting EI required for weight loss in obese dogs. Methods can incorporate either resting energy requirement (RER=70kcal/kg0.75/day) or maintenance energy requirement (MER=105kcal/kg0.75/day), and be based upon either starting body weight (SBW) or target body weight (TBW, estimated from body condition score). In addition, some methods make adjustments for sex and neuter status.

In this retrospective study, the performance of predictive equations were assessed:

1. **Equation 1 (Eq1)**. EI = 0.80 x RER/day, using SBW.
2. **Equation 2 (Eq2)**. EI = 0.80 x RER/day, using TBW.
3. **Equation 3 (Eq3)**. EI = 0.60 x MER/day, using TBW.
4. **Equation 4 (Eq4)**. EI = 0.55-0.65 x MER, again using TBW, with the coefficient differing by sex and neuter status (entire male 0.65; entire female or neutered male 0.60; neutered female 0.55).

Predictions were compared with retrospective weight loss data from 74 obese dogs that had attended the Royal Canin Weight Management Clinic, University of Liverpool. All dogs had successfully reached TBW, and rate of weight loss had been >0.5%/week in the first 28 days. Associations were assessed with simple linear regression, whilst Bland-Altman plots were used to determine accuracy.

For all equations, there was strong positive correlation with actual EI (R2=0.93-0.97, *P*<0.001 for all). On average, Eq1 over-estimated actual EI (median +13%; -26% to +82%, *P<*0.001),with only 27/74 (36%) of estimates being within ±10%. Eq2 under-estimated actual EI on average (median -6%, -32% to +42%, *P<*0.001), although results were more accurate than for M1 (44/74 [59%] of estimates within ±10%). Eq3 over-estimated actual EI on average (median 6%, -23% to +59%, *P<*0.001), but its accuracy was marginally better than Eq2 (49/74 [66%] within ±10%). Eq4 performed best of all, with average results not being significantly different from actual EI (median 2%, -19% to 46%, *P*=0.089), and the best accuracy (53/74 [72%] within ±10%).

Of the predictive equations tested, those based upon MER and TBW predict initial EI requirement for weight loss better than those based upon RER or SBW. Factoring in sex and neuter status improves the accuracy of predictions, and such equations can easily used in general practice.