The purpose of this study was to compare percent body fat estimates from dual-energy X-ray absorptiometry (DEXA) with those derived from total body water (TBW) determined by deuterium oxide (D₂O) dilution and subsequent nuclear magnetic resonance analysis. Percent body fat was estimated by TBW and DEXA in thirty-one dogs representing four breeds and a wide range of body condition scores. Measurements of percent body fat by DEXA averaged 16.6% higher than the calculated estimates from TBW by D₂O dilution. The regression of percent fat by TBW on percent fat by DEXA had a slope of 1.00 with a correlation coefficient of 0.84. The relative agreement between methods was good despite the significant difference in absolute agreement between the two methods. The average difference between methods did not differ by breed, gender, body condition score, body weight or percent fat. The present study was consistent with previous work in which TBW by D₂O underestimated percent body fat in dogs by 15.5%. The excellent relative agreement between percent fat determined by DEXA and D₂O dilution, and the consistency between our data and that from other investigators, suggest that DEXA is a valid and useful method for the in vivo estimation of body composition of dogs.