ENERGY EVALUATION OF EXTRUDED COMPOUND FOODS FOR DOGS BY NEAR-INFRARED SPECTROSCOPY

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Objectives: Near-infrared reflectance spectroscopy (NIRS) was used to predict the chemical composition, the apparent digestibility and the content of digestible nutrients and energy of commercial extruded compound foods for dogs.

Methods: Fifty six compound foods of known chemical composition and *in vivo* apparent digestibility were used, except for the prediction of the crude energy digestibility and the digestible energy content (n=51). Air-dried samples milled through 1mm diameter screen were scanned by a monochromator Foss NIRSystems 6500. Modified partial least square (MPLS) calibration models were developed for organic matter (OM), crude protein (CP), ether extract (EE), crude fibre (CF) and gross energy (GE) content, the apparent digestibility coefficients (OMD, CPD, EED, and GED), and the digestible nutrient and energy content (DOM, DCP, DEE and DGE) of foods. The obtained calibration equations were evaluated by the standard error and the determination coefficient of cross-validation.

Results: The cross-validation coefficients of determination (R^2) were 0.61, 0.99, 0.91, 0.96, and 0.92 for OM, CP, EE, CF and GE, the corresponding standard errors being 5.80, 3.51, 13.35 and 0.36 (g/kg DM) and 0.289 MJ/kg DM, respectively. The cross-validation determination coefficients for the digestibility coefficients were in general slightly lower (0.91, 0.80, 0.82, 0.87 for OMD, CPD, EED and GED), but NIRS prediction of digestible nutrient (g/kg DM) and DGE (MJ/kg DM) content of foods gave satisfactory results, with high R^2 (0.93, 0.97, 0.93 and 0.93 for DOM, DCP, DEE and DGE, respectively) and relatively low standard errors (11.55, 6.85, 12.14 g/kg DM and 0.469 MJ/kg DM) and variation coefficients (1.46, 3.07, 8.57 and 2.54 %).

Conclusions: It is concluded that NIRS can be used to predict the energy value of compound extruded foods for dogs with similar or better precision than that obtained from their proximate analysis, in a rapid and accurate way, although the inclusion of more data covering all the range of commercial foods would be desirable in order to improve the accuracy of the prediction.