A COMPARISON OF FOUR METHODS OF BODY COMPOSITION ANALYSIS

M.R. GALLAGHER, I.H.E. RUTISHAUSER* and K O'DEA*

This study presents a comparison of methods for determining body composition viz, underwater weighing (UWW), skinfold thickness (SF), deuterium oxide dilution (DD) and bioelectrical impedance (BIA). All methods employed depend upon assumptions about the composition of lean body mass and the prediction equations used for analysing SF and BIA are derived from UWW and DD respectively. However it remains important to compare simple techniques which can, with the exception of UWW, be applied in field studies.

Thirty-eight male and 33 female subjects from Deakin University (aged 18-38) participated in the study. UWW was measured using hydrogen dilution to assess lung volume (Pasco et al. 1986). SF was assessed using the Durnin and Womersley (1974) 'sum of 4' skinfolds method. BIA was measured and analysed according to Kushner and Schoeller (1986). In order to assess DD, 3ml aliquots of plasma were taken before and 2h after the oral administration of 10g of deuterium oxide and analysed using nuclear magnetic resonance spectroscopy. The results have been expressed as mean percentage fat ± standard deviation obtained with each method (see table). The only significant difference observed (paired t-test) was for fat assessed from BIA which was significantly lower ($P<0.05$) than from UWW and SF.

Method	%Fat (females)	%Fat (males)
UWW	25.9±6.5	18.9±5.9
SF	25.1±5.2	19.5±4.6
DD	24.2±8.4	18.0±8.9
BIA	23.5±6.7	15.1±5.8

In conclusion assessment of average body fat content for a group with these methods was comparable except for BIA which underestimated fat in comparison with the other methods.

DURNIN, J.V.G.A .and WOMERSLEY, J. (1974). Brit.J.Nutr. 32: 77.
KUSHNER, R.F. and SCHOELLER, D.A. (1986). Am.J.Clin.Nutr. 41: 417.
PASCO, J.A., RUTISHAUSER, I.H.E. and READ, R.S.D. (1986). Nutr.Res. 6: 1139.

Faculty of Applied and Health Sciences, University of Tasmania at Launceston, Tasmania 7248
*Department of Human Nutrition, Deakin University, Victoria 3217