

BODY COMPOSITION - ITS EVALUATION AND MEANING

The most accurate estimation of body composition is achieved by use of the underwater or hydrostatic weighing technique. Obviously, this method places severe restrictions on both practicality and convenience, and the alternative basis of skinfold thickness measurements is therefore used in all but the most stringent of requirements.

The use of skinfold calipers in the performance of skinfold thickness measurements (from which are derived the estimates of body fat) has been well established and documented over the last 40 years, references to which can be found in the Bibliography section of this manual.

These thickness measurements do not measure overall body fat mass or its percentage directly but rely on validated equations that describe the relationship between measures of skinfold fat as well as other body dimensions and the measured body density. Body fat percentage is determined from the estimate of body density.

Various experimenters have put forward equations, which are used with either skinfold thickness alone or in conjunction with other measurements such as body circumference or limb lengths. Two of the most common sets of equations used are attributable to Durnin & Womersley (skinfolds alone), and to Jackson & Pollock (skinfolds and body measurements). The result obtained from the equations (that of body fat density) is subsequently used in the Siri equation to calculate the body fat.

Tables are included that show the fat percentage based on the Durnin and Womersley system. Values are shown for both males and females across the whole age range based on the sum of 4 skinfold measurements, and the results shown for each 2 millimetre increment of skinfold thickness.

Skinfold measurement, when properly taken, correlates very highly (0.83 to 0.89) with hydrostatic weighing, with a standard error of only about 3 or 4 %. In comparison, the correlation of height and weight charts is much lower at about 0.60.

The explanation of the use of skinfold thickness measurement in the derivation of body fat data has been simplified enormously, and can never detract from the tremendous volume of research and scientific ability in the fields of both nutrition and fitness. We all owe much respect and our considerable thanks to the specialists responsible for guiding us towards a healthier life worldwide.