

ASEP Procedure Recommendation: Body Composition Assessment

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The purpose of this paper is to provide a *working draft* of recommended testing procedures for the valid assessment of body composition in research, clinical, and health/fitness settings. The long-term objective is to develop an ASEP Procedure Recommendation for the Assessment of Body Composition. Therefore, you are highly encouraged to submit your ideas and reactions to these proposed recommendations. It is our intention that the final document will reflect the collective wisdom of all exercise physiologists with expertise in and knowledge of body composition assessment.

An extensive review of the literature suggests that densitometry (hydrodensitometry and air displacement plethysmography), hydrometry, and dual-energy x-ray absorptiometry are commonly used to obtain reference measures of body composition in research settings. Typically, estimates of body composition from densitometry or hydrometry are obtained using two-component body composition models (Body mass = fat-free mass + fat mass). The limitations of two-component models are addressed. Also, the merits, shortcomings, and technical errors associated with each of these laboratory methods are compared. Given that each of these reference methods yields indirect measures of body composition, none can be singled out as the “gold standard” method for *in vivo* body composition assessment. It is recommended, instead, that variables obtained from all three methods be used with a multi-component, molecular model to derive reference measures of body composition for research dealing with the development and validation of field methods and prediction equations.

Bioelectrical impedance analysis, skinfolds, and other anthropometric methods are widely used in health/fitness settings to assess body composition. The predictive accuracy of these field methods and prediction equations is limited by the absence of single “gold standard” reference method. The overwhelming majority of field method prediction equations have been developed and cross-validated using a two-component, molecular body composition model in conjunction with only one reference method. Therefore, the prediction error for the body composition estimates obtained with these equations may be greater than expected especially if the individual’s fat-free body density differs greatly from the value assumed for two-component models. With this caution, recommendations are made regarding selected methods/equations to use with diverse subgroups of the population.