

ROUND TABLE DISCUSSION: ANTHROPOMETRY & BODY COMPOSITION

Jacqueline Scaramella, MS, RD
Sport Dietitian (Contractor)
United States Olympic Committee
Jacque.Scaramella@usoc.org

OBJECTIVES

- Understand the different methods of assessing body composition
- Understand the strengths and limitations of each method of assessment
- Identify two compartment vs. three compartment models
- Identify which method might work best for your athlete population/venue/training location

KEY POINTS

Two compartment model – fat mass vs. fat-free mass (hydrostatic weighing, skinfolds, BodPod, BIA)

Three compartment model – provides bone density, fat mass, and fat-free mass (DXA)

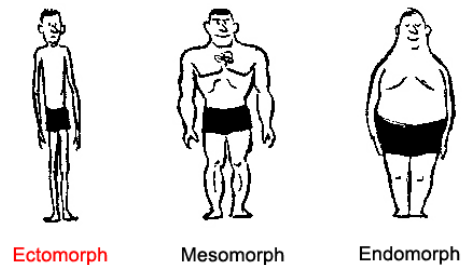
Standard Error: Weight and body composition always have inherent error whether it is due to the tester, equation, equipment or subject. Results are meaningless if accurate procedures are not used and results are not explained adequately to athletes.

Bioelectrical impedance analysis (BIA) – measures the resistance of body water through application of a small electrical current. BIA equipment with upper and lower body electrodes and multiple frequencies capture extracellular and intracellular water more accurately.

Skinfolds – the measurement of subcutaneous fat at different sites on the body.

International Society for the Advancement of Kinanthropometry (ISAK) – includes measurement of height, weight, skinfolds, girths, and bone breadths. This allows for monitoring of health and growth variables, and calculation of somatotypes. The ISAK procedure is a very beneficial method of testing athletes in the field.

- Somatotypes – ectomorph (runner), mesomorph (body builder), endomorph (lineman)



Dual energy x-ray absorptiometry (DXA) – used to analyze fat-free mass, fat mass, and bone mineral density of specific bone regions.

Underwater (hydrostatic) weighing – determines body density through tissue buoyancy in water, which can then be used to calculate percent fat using the Siri or Brozek formulas.

Air Displacement Plethysmography (BodPod) – measures body weight and body volume through air displacement. Once body density is calculated, percent fat is calculated using the Siri or Brozek formulas.

Ultrasound – direct laboratory method which measures the three components: skin, adipose tissue and muscle. Based on the pulse-echo technique, where a short pulse is applied and travels with the speed of sound in the given tissue.

RESOURCES

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The International Society for the Advancement of Kinanthropometry (ISAK). Retrieved from <http://www.isakonline.com/>