Metabolic Equivalents of College-Aged Male Athletes

Kathleen Rusbacky

Advisor: Dr. Lloyd Laubach

Why?

- Metabolic Equivalent- Assumed
  - 3.5 ml O_2 /kg/min
    - Value determined by 1 male, 40 yr old, 70 kg
- Byrne:671 subjects, varying ages and genders
  - MET = 2.6 ml/kg/min

Due to conflicting results, the purpose of this study is to determine whether the accepted value of 3.5 ml O_2 /kg/min is an acceptable MET value for male college athletes aged 18-25.

Descriptive Statistics

Football Players N=10

	Height (cm)	Weight (kg)	BMI (kg/m²)	Body Fat %	Fat Mass (kg)	Lean Mass (kg)	VO2 (ml/min)	MET (ml/kg/min)
Mean	186.6	119.04	34.2	27.9	32.32	85.7	430	3.57
SD	2.63	8.79	2.58	4.99	7.25	6.72	60	0.46
Max	189.1	134.39	38.7	35.6	47.80	98.1	500	4.23
Min	182.0	104.31	30.9	17.2	20.44	75.1	300	2.53

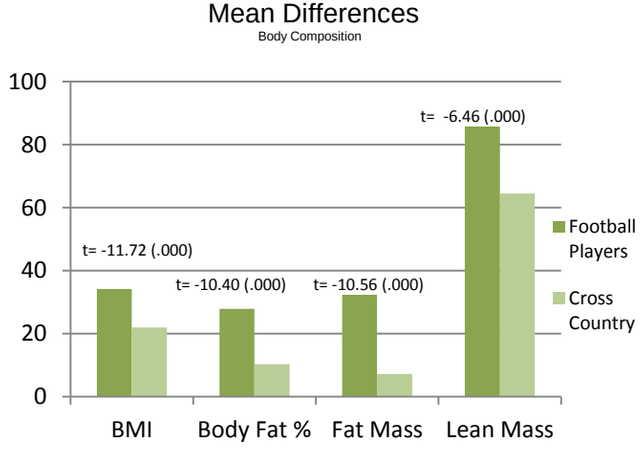
Cross Country Runners N = 10

	Height (cm)	Weight (kg)	BMI (kg/m²)	Body Fat %	Fat Mass (kg)	Lean Mass (kg)	VO2 (ml/min)	MET (ml/kg/min)
Mean	179.38	71.66	21.9	10.03	7.22	64.44	330	4.51
SD	5.46	9.03	2.05	2.12	2.00	7.96	100	1.12
Max	190.10	90.40	24.9	14.5	11.80	83.00	470	5.72
Min	170.87	60.36	18.6	6.50	4.00	54.20	160	2.65

Subjects and Methods

University of Dayton male athletes aged 18-25
- 10 Cross Country runners
  - BMI between 18.5 and 24.9 (Normal Range)
- 10 Football Linemen
  - BMI ≥ 30.0 (Obese Range)

- Height, Weight, BMI
- Body Composition via Bod Pod
  - HBD via Air Displacement
  - Siri Equation: 495÷HBD – 450
  - Percent Fat, Lean Body Mass, Fat Mass
- Resting Metabolism via Indirect Calorimetry
  - Parvo Medics TrueOne 2400
  - Mouth piece, head piece, nose clip, connecting tube
    - VO_2, VCO_2, Calories, RER
  - Steady State Heart Rate for 5 Minutes
    - Polar Heart Rate Monitor



Findings

- "Accepted Value": 3.5 ml/kg/min
- Byrne Value: 2.56 ml/kg/min
- Experimental Values:
  - Football: 3.57 ml/kg/min
  - Cross country: 4.51 ml/kg/min
  - Total: 4.04 ml/kg/min
- Percent Differences
  - Football: 39.5% greater
  - Cross Country: 76.2% Greater
  - Total: 57.8% Greater

Reasons for Differences: Small sample size, age, heterogeneous vs. homogeneous group, BMI

Conclusion: Assumed MET value may not be accurate for all populations

