

## Calculating BMI and Estimated Energy Requirements (EER)

### 1. Conversions

- a. Convert height from inches into meters (remember that each “foot” of height is equivalent to 12 inches so if a person is 5 ft. 10 in. tall, his height is 70 in. )

Divide height in inches by 39.37 to find height in meters

example: 70 inches  $\div$  39.37 inches/meter = 1.78 meters (rounded off)

- b. Convert weight from pounds into kilograms

Divide weight in pounds by 2.2 to find weight in kilograms

example 175 pounds  $\div$  2.2 = 79.55 kg (rounded off)

### 2. Calculate BMI (Body Mass Index) – note BMI is an index of height & weight, there are no units associated with BMI, it is simply reported as a number

- a.  $[\text{weight (lbs)} \times 703] \div [\text{height (in)}]^2 = \text{BMI}$

example:  $(175 \times 703) \div 70^2 = 25.11$  (Just into the “overweight” range)

- b.  $\text{weight (kg)} \div \text{height (m)}^2 = \text{BMI}$

example:  $79.55 \div 1.78^2 = 25.11$  (Note: the “English” and the metric calculations will not always yield exactly the same result depending on how much rounding off is done in conversions. They should be close, however.)

### 3. Calculate Estimated Energy Requirements (EER) from the DRI equations.

We will be using equations for adults; there are also equations for infants and children. There are separate equations for men and women. You need to convert body measurements (ht & wt) to metric units for these calculations.

Men: 19 years and older

$$\text{EER} = [662 - (9.53 \times \text{age})] + \text{PA}^* \times [(15.91 \times \text{wt}) + (539.6 \times \text{ht})]$$

Women: 19 years and older

$$\text{EER} = [(354 - (6.91 \times \text{age})) + \text{PA} \times [(9.36 \times \text{wt}) + (726 \times \text{ht})]$$

\*PA = Physical Activity Factor

Physical Activity (PA) Factors for EER Equations

	Men	Women	Physical Activity
Sedentary	1.0	1.0	Typical daily living activities
Low active	1.11	1.12	Plus 30-60 minutes moderate activity
Active	1.25	1.27	Plus $\geq$ 60 minutes moderate activity
Very active	1.48	1.45	Plus $\geq$ 60 minutes moderate activity and 60 minutes vigorous or 120 minutes moderate activity

Example:

20 year old male, 5 feet 10 inches in height, 175 pounds. A full-time student, he spends 45 minutes in the gym 5-6 days a week doing a variety of strength, flexibility, and aerobic activities. He also jogs on local trails 3-5 miles, 3-4 times a week.

If you add up his minutes and average out over 7 days he is basically between "low active" and "active". You could use either factor. For illustration purposes, we will use "active".

$$\text{EER} = [662 - (9.53 \times 20)] + 1.45 \times [(15.91 \times 79.55) + (539.6 \times 1.78)]$$

$$\text{EER} = [662 - 190.6] + 1.45 \times [1256.64 + 960.49]$$

$$\text{EER} = 471.4 + (1.45 \times 2217.13)$$

$$\text{EER} = 471.4 + 3214.84$$

$$\text{EER} = 3686$$

4. Really easy way to obtain both BMI and EER:

<http://fnic.nal.usda.gov/interactiveDRI/>