

Lab 8: Energy Requirements and Ideal Weight

It will be helpful if you have your three-day food and activity record completed before this lab. It will also be helpful to have a calculator.

8.1 Average Daily Energy Intake. This will be calculated by the computer software, you do not need to calculate the energy content of your food.

8.2 Average Daily Energy Requirement. We will calculate three components to your daily energy requirement.

Voluntary Daily Activity (VDA). “Voluntary Daily Activity” describes the energy that you use while doing things that you voluntarily choose to do. These activities are ones that you engage in above and beyond laying on a couch all day. Activities on your list might include walking, studying, light housekeeping, cooking, showering, driving, swimming, rock climbing, etc. Your VDA will be calculated by the computer software based upon your three-day activity record.

Basal Metabolic Rate (BMR). Basal metabolic rate is the amount of energy you use at rest. This energy is used to contract your heart and diaphragm muscles, transmit nerve impulses, maintain body temperature, etc. Complete the measurements and calculations in the lab manual to determine your daily BMR.

Specific Dynamic Action (SDA). Specific dynamic action is the amount of energy you use to move, digest and absorb food from your digestive tract. Multiply your average daily caloric intake (from the computer printouts) times 10%. Record in your lab manual. Note that this method differs from the lab manual.

8.3 Energy Balance. Complete the comparison of your energy intake and daily energy requirement (energy output). It may not be possible to determine if you have gained or lost weight over a three-day period. However, this comparison is a good way to evaluate whether you have accurately estimated your activity level and accurately recorded your food intake. If you think that both are representative of your intake and output, then you should notice a recent trend in weight loss or gain.

Note: One pound of adipose tissue contains 3500 Calories. To lose weight at a recommended rate of 1 pound/week, either increase energy expenditure by 500 Calories/day or decrease energy intake by 500 Calories/day.

$$500 \text{ Calories/day} \times 7 \text{ days} = 3500 \text{ Calories/week} = 1 \text{ pound lost}$$

8.4 Ideal Weight. Use all three methods presented to determine your “ideal weight”. In addition, use the BMI tables to determine your Body Mass Index. Ideal weights will vary, which do you think is most accurate for you?

Body Mass Index (BMI). Current standards for healthy body weight are based upon BMI. BMI is a specific relationship between a person’s height and weight. There are tables available in lab to look up your BMI. To calculate your BMI without a table do the following:

$$\text{BMI} = \frac{\text{Weight in Kg or Weight in lb. x 705}}{\text{Height in m}^2 \text{ Height in inches}^2}$$

1. Divide your weight in pounds by 2.2 to determine your weight in kilograms (2.2 lb. = 1 Kg).
2. Determine your height in meters by using the table on page 104. Square your height in meters.
3. Divide your weight in kilograms by your height in meters squared.

Interpretation of BMI¹

	BMI
Underweight	18.5
Healthy	19-24
Overweight	25-29
Obese	30
Average US female	26

Weight Based on Body Composition. The following is provided for your information. You do not need to memorize these figures.

Percent Body Weight in Fat

	Male	Female
Athletes	5-10%	15-20%
Others	10-25%	18-32%
Health risks for the young	22%	32%
Health risks for those over 40	35%	35%
Lower danger	<5%	<10%

¹ Adapted from *Understanding Nutrition, 9th Ed.*. Whitney, E. N. and S. R. Rolfes. 2002. Wadsworth/Thompson Learning, Belmont, CA.