

# You Do the Math

## Calculating the Energy Contribution of Carbohydrates, Fats, and Proteins

The energy in food is used for everything from maintaining normal body functions—such as breathing, digesting food, and repairing damaged tissues and organs—to enabling you to perform physical activity and even to read this text. So how much energy is produced from the foods you eat?

To answer this question, you need to know the following information:

- Carbohydrates should make up the largest percentage of your nutrient intake, about 45–65%; they provide 4 kcal of energy per gram of carbohydrate consumed.
- Proteins also provide 4 kcal of energy per gram; they should be limited to 10–35% of your daily energy intake.
- Fats provide the most energy, 9 kcal per gram; they should make up 20–35% of your total energy intake.

In order to figure out whether you're taking in the appropriate percentages of carbohydrates, fats, and proteins, you will need to use a little math.

1. Let's say you have completed a personal diet analysis, and you consume 2,500 kcal per day. You consume 300 g of carbohydrates, 90 g of fat, and 123 g of protein.
2. To calculate your percentage of total energy that comes from carbohydrate, you must do two things:
  - a. Multiply your total grams of carbohydrate by the energy value for carbohydrate.

$$\begin{aligned} 300 \text{ g of carbohydrate} \times 4 \text{ kcal/g} \\ = 1,200 \text{ kcal of carbohydrate consumed} \end{aligned}$$

- b. Take the kcal of carbohydrate consumed, divide this by the total kcal consumed, and multiply by 100. This will give you the percentage of the total energy you consume that comes from carbohydrate.

$$(1,200 \text{ kcal} / 2,500 \text{ kcal}) \times 100 = 48\% \text{ of total energy comes from carbohydrate}$$

3. To calculate your percentage of total energy that comes from fat, you follow the same steps but incorporate the energy value for fat:

**3.** To calculate your percentage of total energy that comes from fat, you follow the same steps but incorporate the energy value for fat:

**a.**  $90 \text{ g of fat} \times 9 \text{ kcal/g} = 810 \text{ kcal of fat}$

**b.**  $(810 \text{ kcal} / 2,500 \text{ kcal}) \times 100 = 32.4\%$  of total energy comes from fat

Now try these steps to calculate the percentage of the total energy you consume that comes from protein.

Also, have you ever heard that alcohol provides “empty Calories”? Alcohol contributes 7 kcal per gram. You can calculate the percentage of kcal from alcohol in your daily diet, but remember that it is not considered an energy nutrient.

These calculations will be very useful throughout this course as you learn more about how to design a healthful diet and how to read labels to help you meet your nutritional goals. Later in this book you will learn how to estimate your unique energy needs.