

## MODULE D: DIET SELF-STUDY EXERCISES

How well do you eat? Our purpose in providing self-study exercises is to encourage you to study your diet. Your reaction to these exercises may be mixed. They will require time and attention, and like your checkbook they have to be done carefully so that they will be accurate and meaningful. The rewards, however, usually outweigh the drawbacks. Most students report that, unlike their checkbooks, these exercises are intriguing, informative, and often reassuring. When doing these self-studies, keep in mind that the more accurate and complete your input, the more reliable the output will be.

### Self-Study 1: Record What You Eat and Calculate Your Nutrient Intakes

In this first exercise, you are to record your typical food intake. To get a true average, record all of the meals, snacks, and beverages (including water) you consume for at least two weekdays and one weekend day. If the types and amounts of foods you eat vary greatly from day to day, you may want to record your intake for additional days; make as many copies of the form (Form 1-A if you are hand calculating; Form 1-B if you are using computer software) as you need.

Keep a copy of the form with you throughout the day to record information promptly. As you record each food, make a note of the amount. Weight, measure, or count food carefully. If you are unable to estimate serving sizes, measure out servings the size of a cup, tablespoon, and teaspoon onto a plate or into a bowl to see how they look. In guessing at the sizes of meat portions, it helps to know that a piece of meat the size of the palm of your hand weighs about 3 or 4 ounces. It also helps to know that a slice of cheese (such as sliced American cheese) or a 1 ½-inch cube of cheese weighs roughly 1 ounce. Food labels can also help you estimate serving sizes.

You will also need to carefully describe the foods and how they were prepared. For example, were the peaches you ate fresh or canned? Was the piece of chicken a drumstick or a thigh? Was it roasted or fried?

Nutrition information from many mixed dishes is available, but in some cases you may have to break down mixed dishes to their ingredients. A ham and cheese sandwich, for example, might be listed as 2 slices of bread, 1 tablespoon of mayonnaise, 2 ounces of ham, 1 ounce of cheese, and so on. If you can't discover all the ingredients, estimate the amounts of only the major ones, like the beef, tomatoes, and potatoes in a beef-vegetable soup. You will, of course, make errors in estimating amounts. In calculations of this kind, errors of up to 20 percent are expected and tolerated.

Do not record any nutrient supplements you take. It will be interesting to discover whether your food choices alone deliver the nutrients you need. If they do not, these self-study exercises will enable you to choose foods that do meet your nutrient needs, so that supplements will not be necessary.

Note: The forms for recording food intake and instructions for calculating nutrients differ depending on which method you use to analyze your diet. Forms are found at the end of these Self-Study Exercises. If you are doing these exercises by hand using a food composition table, follow Self-Study 1A (use Forms 1-A, 2-A, and 3-A); if you are using a computer diet analysis program, follow Self-Study 1B (use Form 1-B). In both cases, return to Self-Study 2 to analyze your findings.

## SELF-STUDY 1A: INSTRUCTIONS FOR RECORDING FOOD INTAKE AND HAND CALCULATING NUTRIENT CONTENT USING FOOD COMPOSITION TABLES

**Recording.** Use one copy of Form 1-A for each day's food intake; make as many copies as needed of the form first. Fill in only columns 1 (food) and 2 (approximate measure or weight) for now. When you have completed your record for all three (or more) days, you can begin looking up each food and beverage in a food composition table and entering the amounts of nutrients for each item in the remaining columns.

If the foods you have eaten are not listed in the food composition table, use the most similar food you can find. For example, if you ate smoked cod (which is not listed), you would not be far off using the values for smoked halibut.

Be careful in recording the nutrient amounts in odd-sized portions. For example, if you used a quarter cup of milk, then you will have to record a fourth of the amount of every nutrient listed for 1 cup of milk. Note the units in which the nutrients are measured:

- Energy is measured in calories (kcal).
- Protein, carbohydrate, fiber, fat, and fatty acids are measured in grams (g).
- Cholesterol, calcium, iron, magnesium, phosphorus, potassium, sodium, zinc, thiamin, riboflavin, niacin, vitamin B<sub>6</sub>, and vitamin C are measured in milligrams (mg)—thousandths of a gram. Thus 800 milligrams is the same as 0.8 grams calcium; be sure to convert all calcium amounts to milligrams before calculating.
- Folate is measured in micrograms (mcg or  $\mu\text{g}$ )—thousandths of a milligram. Thus 400 micrograms folate is the same as 0.4 milligrams folate; be sure to convert all folate amounts to micrograms before calculating.
- Vitamin A is sometimes measured in international units (IU) and sometimes in retinol equivalents (RE): 1 RE equals about 3 IU of vitamin A from animal foods, 10 IU of vitamin A from plant foods, or, on the average, 5 IU (for mixed dishes). Food composition tables may list vitamin A in RE to ease comparison with the RDA, which is also in RE. If you find vitamin A listed in IU on a label, be sure to convert to RE before calculating.

**Calculating.** Now total the amount of each nutrient you've consumed for each day, and transfer your totals from your three (or more) copies of Form 1-A to Form 2-A. Form 2-A provides a convenient means of deriving and keeping on record an average intake for each nutrient.

Form 2-A also allows you to compare your average intakes with a standard such as the RDA (or AI). Enter the nutrient intakes recommended for a person of your age and sex, referring to the DRI tables in your textbook. For total carbohydrate and fat, use the AMDR. For intakes of saturated fat and cholesterol, use the Daily Values. For energy, estimate your daily energy output using the method described in your text. Suspend judgment on the adequacy of your diet for now; the remaining self-studies will guide you in analyzing each of the nutrients provided by your diet.

Use Form 3-A to calculate the percentage of calories derived from carbohydrate, fat, protein, and alcohol. (Refer to your textbook if you need help doing the calculations.) Later self-study exercises help you to compare these percentages with recommendations and guidelines.

**SELF-STUDY 1-B:**  
**INSTRUCTIONS FOR RECORDING FOOD INTAKE AND**  
**CALCULATING NUTRIENT CONTENT USING WADSWORTH'S**  
***DIET ANALYSIS PLUS* SOFTWARE**

Use one copy of Form 1-B for each day's food intake. When you have completed your record for all three (or more) days you can begin entering the foods and beverages into the computer. Items can be entered either by searching for the food name. Be sure to spell correctly so the computer search can find your entry, and try searching by brand name or restaurant name if you need to narrow your search. The software documentation included with your computer program will help you to complete your diet analysis using the software.





### FORM 3A

#### Percentage of kcalories from Protein, Fat, Carbohydrate, and Alcohol

##### Average Daily Intake from Form 2A:

Protein: \_\_\_\_\_ g/day  $\times$  4 kcal/g = (P) \_\_\_\_\_ kcal/day.

Fat: \_\_\_\_\_ g/day  $\times$  9 kcal/g = (F) \_\_\_\_\_ kcal/day.

Carbohydrate: \_\_\_\_\_ g/day  $\times$  4 kcal/g = (C) \_\_\_\_\_ kcal/day.

If you consumed an alcoholic beverage, include its calories.<sup>a</sup>

Alcohol: \_\_\_\_\_ = (A) \_\_\_\_\_ kcal/day.

Total kcal/day = (T) \_\_\_\_\_ kcal/day.

Percentage of kcalories from protein:  $(P \div T) \times 100$  = \_\_\_\_\_ % of total kcalories.

Percentage of kcalories from fat:  $(F \div T) \times 100$  = \_\_\_\_\_ % of total kcalories.

Percentage of kcalories from carbohydrate:  $(C \div T) \times 100$  = \_\_\_\_\_ % of total kcalories.

Percentage of kcalories from alcohol, if any:  $(A \div T) \times 100$  = \_\_\_\_\_ % of total kcalories.

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*Note:* The four percentages can total 99, 100, or 101, depending on the way figures were rounded off earlier.

<sup>a</sup> To find out how many kcalories in a beverage are from alcohol, look up the beverage in a food composition table. Figure out how many kcalories are from carbohydrate (multiply carbohydrate grams times 4), fat (fat grams times 9), and protein (protein grams times 4). The remaining kcalories are from alcohol.





The remaining self-study exercises can be completed using:

- Forms 2-A and 3-A if you used the hand-calculation method. If you need help with calculations, refer to your textbook.
- The computer printout reports if you used computer software.

### SELF-STUDY 2: EVALUATE YOUR ENERGY INTAKE

1. What is your average daily intake?
2. How does your estimated daily output compare with your average energy intake?
3. Have you been gaining or losing weight recently?

If so, is this consistent with the differences between your intake and estimated output?

by Sharon Rady Rolfes

4. If you drank alcoholic beverages, how many drinks did you consume?

How many kcalories did alcohol contribute to your daily energy intake?

What percentage of your energy intake comes from alcohol?

Recommendations suggest that for those who consume alcohol, it should contribute no more than 5 percent of the total energy intake or two drinks daily, whichever is less. Later self-studies examine what percentage of your energy intake comes from protein, fat, and carbohydrate and whether these fall in line with current recommendations.

### SELF-STUDY 3: EVALUATE YOUR CARBOHYDRATE INTAKE

1. How many grams of carbohydrate do you consume in an average day? \_\_\_\_\_
  
2. How many kcalories does this represent? (Remember, 1 gram of carbohydrate contributes 4 kcalories.) \_\_\_\_\_
  
3. It is estimated that you should have at least 130 grams, and ideally much more, of carbohydrate in a day. How does your intake compare with this minimum? \_\_\_\_\_  
\_\_\_\_\_
  
4. What percentage of your total kcalories is contributed by carbohydrate? \_\_\_\_\_
  
5. Is your intake in line with the recommendation that 45 to 65 percent of the kcalories in your diet should come from carbohydrate? \_\_\_\_\_
  
6. Another dietary goal is that no more than 10 percent of total kcalories should come from refined and other processed sugars and foods high in such sugars. To assess your intake against this standard, sort the carbohydrate-containing food items you ate into three groups:
  - Nutritious foods containing complex carbohydrates (foods such as breads, legumes, and vegetables).  
\_\_\_\_\_  
\_\_\_\_\_
  - Nutritious foods containing simple carbohydrates (foods such as milk products and fruits).  
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\_\_\_\_\_
  - Foods containing mostly concentrated simple carbohydrates (foods such as sugar, honey, molasses, syrup, jam, jelly, candy, cakes, doughnuts, sweet rolls, cola beverages, and so on).  
\_\_\_\_\_  
\_\_\_\_\_

Estimate and include such sources as the syrup of canned fruit, the sugars of flavored yogurts, and the sugars added during processing.

7. How many grams of carbohydrate did you consume in each of these three categories? \_\_\_\_\_

\_\_\_\_\_

How many kcalories (grams times 4)? \_\_\_\_\_

What percentage of your total kcalories comes from concentrated sugars? \_\_\_\_\_

Does your concentrated sugar intake fall within the recommended maximum of 10 percent of total kcalories? \_\_\_\_\_ If not, what food choices account for the excess sugar? \_\_\_\_\_

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8. Estimate how many pounds of sugar (concentrated simple carbohydrate) you eat in a year (1 pound = 454 grams). How does your yearly sugar intake compare with the estimated U.S. average of about 45 pounds per person per year? \_\_\_\_\_

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9. How many grams of fiber do you consume in an average day? \_\_\_\_\_

How does your intake compare with the recommendations to consume 20 to 35 grams of dietary fiber per day? \_\_\_\_\_

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### SELF-STUDY 4: EVALUATE YOUR FAT INTAKE

1. How many grams of fat do you consume on an average day?
2. How many kcalories does this represent? (Remember, 1 gram of fat contributes 9 kcalories.)
3. What percentage of your total energy is contributed by fat?
4. How does your fat intake compare with the recommendation that says fat should contribute 20-35 percent of total food energy? \_\_\_\_\_ If it is higher, look over your food records: what specific foods could you cut down on or eliminate, and what foods could you replace them with, to bring your total fat intake into line?
5. How much linoleic acid do you consume? (Refer to your average for polyunsaturated fatty acids, and assume that most of these fatty acids are linoleic acid.)

Remembering that linoleic acid is a lipid (energy value, 9 kcalories per gram), calculate the number of kcalories it gives you. What percentage of your total energy comes from linoleic acid? A guideline recommends 5 to 10 percent of total energy intake.

6. The Committee on Dietary Reference Intakes has not established an RDA for omega-3 fatty acids. However, you can guess at the adequacy of your intake by answering the following questions. Do you eat leafy vegetables, fish, and seafood, or other foods listed as sources of omega-3 fatty acids in your text? \_\_\_\_\_ Do you use canola or soybean oil for home cooking and for salads? \_\_\_\_\_ If you include just one of these categories of foods each day, you may receive enough omega-3 fatty acids. If you never eat these foods, you might want to find ways to include them.

7. How much cholesterol do you consume daily? \_\_\_\_\_ How does your cholesterol intake compare with the suggested limit of 300 milligrams a day?

If your intake is high, what foods could you cut down on or eliminate to bring your cholesterol intake within suggested limits?

### SELF-STUDY 5: EVALUATE YOUR PROTEIN INTAKE

1. How many grams of protein do you consume on an average day?
2. How many kcalories does this represent? (Remember, 1 gram of protein contributes 4 kcalories.)
3. What percentage of your total food energy is contributed by protein?
4. Diets that meet the suggested balance of about 45 to 65 percent of the kcalories from carbohydrate, 20 to 35 percent from fat, contribute about 10 to 35 percent of total food energy from protein. How does your protein intake compare with this recommendation?

If your protein intake is out of line, what foods could you consume more of—or less of—to bring it into line?

5. Calculate your protein RDA (0.8 grams per kilogram of body weight).

Is it similar to the RDA for an “average” person of your age and sex as shown in the RDA tables?

by Sharon Rady Rolfes

6. Compare your average daily protein intake with your RDA. The *Diet and Health* report suggests that you eat no more than twice your RDA for protein. Does your intake exceed twice your RDA?

If so, you are spending protein prices for an energy-yielding nutrient and displacing other foods. What substitutions could you make in your day's food choices so that you would derive the energy you need from carbohydrate rather than from protein?

7. How many of your protein grams are from animal, and how many from plant, foods?

Assuming that the animal protein is all of high quality, no more than 20 percent of your total protein need come from this source. Should you alter the ratio of plant to animal protein in your diet?

If you did, what effect would this have on the total *fat* content of your diet?

8. How is your protein intake distributed through the day? (At what times do you eat how many grams of protein?)

## SELF-STUDY 6: EVALUATE YOUR WEIGHT AND HEALTH RISKS

What weight is appropriate for you? When physical health alone is considered, a wide range of weights is acceptable for a person of a given height. Within the safe range, the choice of a weight is up to the individual.

1. Determine whether your current weight is appropriate for your height.

- Record your height: \_\_\_\_\_ in (or cm).
- Record your weight: \_\_\_\_\_ lb (or kg).

Look up the acceptable weight range for a person of your height.

- Record the entire range: \_\_\_\_\_ to \_\_\_\_\_ lb (or kg).

Does your current weight fall within the suggested range? \_\_\_\_\_ Calculate your BMI using the equation provided in your textbook.

- Record your BMI: \_\_\_\_\_ kg/m<sup>2</sup>.

Look up the risk of disease and mortality for a person with your BMI value.

- Record your risk level based on your BMI: \_\_\_\_\_

If this level of risk is unacceptable, calculate the weight needed for a desired BMI value (divide the desired BMI by the appropriate height factor). For example, a 165-pound person who is 5 feet 5 inches tall has a BMI of 27.5. To obtain a BMI of 22, the person would need to weigh about 133 pounds ( $22 \div 0.166$ ).

- Record your desired weight based on your height and desired BMI: \_\_\_\_\_

If you are underweight and your BMI is below 19, you may need to gain weight for your health's sake (but, if you are healthy, you should maintain your current weight). If your weight is over the acceptable weight range and your BMI value is associated with an unacceptable risk of disease, you may want to examine your body's fat distribution.

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2. Determine whether your fat distribution is associated with health risks.
  - Record your waist measurement: \_\_\_\_\_ in (or cm).

Calculate the waist-to-hip ratio by dividing the number of inches (or centimeters) around your waistline by the number of inches (or centimeters) around your hips.

Women with a circumference of greater than 35 inches and men with a circumference of greater than 42 inches are at a high risk for obesity-related health problems.

3. Check your health history. A family or personal medical history of diabetes, hypertension, or high blood cholesterol signals the need to pay attention to diet and exercise habits. Based on these three considerations, how does your current weight compare with standards that are compatible with health?

### SELF-STUDY 7: EVALUATE YOUR VITAMIN INTAKES

1. Compare your average intake with your recommended intake of thiamin. What percentage of your recommended intake of thiamin did you consume?

Was this enough?

What foods contribute the greatest amount of thiamin to your diet?

2. Answer these same questions for riboflavin, niacin, vitamin B<sub>6</sub>, folate, vitamin C, vitamin A, and vitamin E.

3. Regarding niacin, remember that preformed dietary niacin is not the only source your body uses; it also uses the amino acid tryptophan, if extra is available after protein needs are met. Did you consume enough niacin preformed in foods to meet your recommended intake?

If not, calculate your niacin equivalents. Did you consume enough extra protein to bring your intake up to the recommendation for niacin?

4. Food composition data is often lacking for vitamins D and K, but you can guess at the adequacy of your intake. For vitamin D, answer the following questions: Do you drink fortified milk (read the label)?

Eat eggs?

Liver?

Are you in the sun enough to promote vitamin D synthesis? (Remember, though, that excessive exposure to sun can cause skin cancer in susceptible individuals.)

5. For vitamin K, does your diet include 2 cups of milk or the equivalent in milk products every day?

Does it include leafy vegetables frequently (every other day)?

Do you take antibiotics regularly (which inhibit the production of vitamin K by your intestinal bacteria)?

### SELF-STUDY 8: EVALUATE YOUR WATER AND MINERAL INTAKES

1. How much water do you drink daily? \_\_\_\_\_ How does this compare with the recommendation to drink at least 1 milliliter per calorie expended? \_\_\_\_\_  
\_\_\_\_\_
2. Compare your average intake of calcium with your recommended intake. What percentage of your recommended intake of calcium did you consume? \_\_\_\_\_ Was this enough? \_\_\_\_\_ What foods contribute the greatest amount of calcium to your diet? \_\_\_\_\_  
\_\_\_\_\_ If you consumed more than the recommendation, was this too much? \_\_\_\_\_ Why or why not? \_\_\_\_\_  
\_\_\_\_\_ In what ways would you change your diet to improve it in this respect? \_\_\_\_\_  
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3. Answer these same questions for magnesium and potassium. \_\_\_\_\_  
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4. Compare your average intake of sodium with your AI for sodium. What foods contribute the greatest amount of sodium to your diet? \_\_\_\_\_  
\_\_\_\_\_ If you consumed more than the recommendation, how could you change your diet to improve it in this respect? \_\_\_\_\_
5. Compare your average intake of iron with your recommended intake. What percentage of your recommended iron intake did you consume? \_\_\_\_\_ Which of the foods you eat supply the most iron? \_\_\_\_\_ Rank your top five iron contributors. \_\_\_\_\_  
\_\_\_\_\_  
How many were meats? \_\_\_\_\_ Legumes? \_\_\_\_\_ How much of a contribution does enriched or whole-grain bread or cereal make to your iron intake? \_\_\_\_\_ Does your diet

include refined bread/cereal products, such as pastries, that you could replace with enriched or whole-grain products to increase your iron intake? \_\_\_\_\_

6. Compute your iron absorption from a meal of your choosing. \_\_\_\_\_ The RDA assumes you will absorb 10 percent of the iron you ingest. What percentage did you absorb? \_\_\_\_\_ If you are a man of any age or a woman over 50, you need to absorb about 1 milligram per day; if you are a woman 11 to 50 years old, 1.5 milligrams. How could you best eat to improve your iron absorption? \_\_\_\_\_

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7. Compare your average intake of zinc with your recommended intake. What percentage of your recommended zinc intake did you consume? \_\_\_\_\_ Which were your best food sources? \_\_\_\_\_ What guidelines can help you to obtain enough zinc from the foods you eat? \_\_\_\_\_

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8. Food composition data is often lacking for iodine and fluoride, but you can guess at the adequacy of your intake. Are you in an area of the country where the soil is iodine-poor? \_\_\_\_\_ If so, do you use iodized salt? \_\_\_\_\_ Is the water in your area fluoridated? (Call the county health department.) \_\_\_\_\_ If not, how do you and your family ensure that your intakes of fluoride are optimal? \_\_\_\_\_

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9. Review your three-day food record, and separate the foods you ate into two categories: natural, unprocessed foods; and highly processed foods, such as frozen dinners and breakfast bars. Beside each food, record its kcalorie value. What percentage of your energy intake came from highly processed foods? \_\_\_\_\_ What do you suppose this estimate implies about your diet's mineral adequacy? \_\_\_\_\_

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