NUTRITION

Menu planners must have a basic understanding of nutrition because the human body requires a variety of foods in order to function and be healthy.

The food-service worker's responsibility to provide nutritious food and well-balanced menus depends, in part, on the operation. School and hospital food services must, of course, plan menus carefully to meet basic nutritional needs. A qualified dietitian is usually required in such establishments.

The obligations of restaurateurs are more subtle. Because they are in business to sell food, they must offer foods that will attract customers. People who plan menus are as concerned with presenting attractive, flavorful foods as they are with serving nutritious foods. Also, if the menu is à la carte, there is no way to ensure a customer will order items that make up a nutritionally balanced meal.

But restaurateurs do have an obligation to offer a choice. That is, menus should be planned so customers can order well-balanced meals if they desire. People are becoming more concerned with fitness and health, so a nutritiously balanced menu may even help attract customers.

AFTER READING THIS CHAPTER, YOU SHOULD BE ABLE TO

1. List and describe the six categories of nutrients, explain their functions in the body, and name some food sources of each.
2. Define the term *calorie* and describe the relationship between calories and weight gain.
3. List and describe the eight guidelines for maintaining a healthful diet.
4. Describe ways that cooks can incorporate nutrition principles into their cooking and their menu construction.

Carbohydrates

Carbohydrates are compounds consisting of carbon, hydrogen, and oxygen atoms bound together in chains of varying lengths.

Sugars are simple carbohydrates. Simple sugars, such as glucose, are small compounds containing 6 carbon atoms. Table sugar, or sucrose, is a larger sugar molecule with 12 carbon atoms. Sugars are found in sweets and, to a lesser extent, in fruits and vegetables.

Starches are complex carbohydrates consisting of long chains of simple sugars bound together. They are found in such foods as grains, bread, peas and beans, and many vegetables and fruits.

Carbohydrates are the body's most important source of food energy. Fats and proteins can also be burned for energy, but the body uses carbohydrates first. If no carbohydrates are available, the body then burns fat. However, if fats are burned with no carbohydrates present, toxic compounds called **ketone bodies** are produced. If too many ketone bodies accumulate, a condition called **ketosis** develops, and the blood becomes unable to carry oxygen properly. The result can be fatal. Thus, one of the important functions of carbohydrates is to help the body burn fat properly. About 50 to 100 grams carbohydrate are needed every day to prevent ketosis.

Most authorities believe complex carbohydrates, especially those from whole grains and unrefined foods, are better for you than simple carbohydrates. This is partly because starchy foods also have many other nutrients, while sweets have few other nutrients. Also, there is some evidence that a lot of sugar in the diet may contribute to heart and circulatory diseases. Simple sugars and refined starches are primary sources of empty calories.

Another reason carbohydrates from whole grains and unrefined foods are preferable to those from refined sugars and starches is that these unrefined foods are sources of fiber. The term **fiber** refers to a group of carbohydrates that cannot be absorbed and used by the body. Therefore, fiber supplies no food energy. However, it is important for the proper functioning of the intestinal tract and the elimination of body waste. In addition, there is evidence that sufficient dietary fiber helps prevent some kinds of cancers and helps decrease cholesterol in the blood. Fruits and vegetables, especially raw, and whole grains supply dietary fiber.

Fiber can be classified as either soluble or insoluble. **Soluble fiber** absorbs water and forms a kind of gel. It is found inside and between plant cells. **Insoluble fiber** also absorbs water, but less, and forms bulk in the intestines. It is found in cell walls and other structural parts of plants.

Fats

Fats supply energy to the body in highly concentrated form. Also, some fatty acids are necessary for regulating certain body functions. Third, fats act as carriers of fat-soluble vitamins (vitamins A, D, E, and K). Because of these important functions, it is necessary to have some fats in the diet.

Fats may be classified as **saturated**, **monounsaturated**, or **polyunsaturated**. These terms reflect chemical differences in the composition of fats. Cooks do not need to know the chemical structure of fats, but they should understand their nutritional characteristics and the foods in which they are found. Many foods contain a combination of these three types, with one type predominating.

Saturated fats are solid at room temperature. Animal products—meats, poultry, fish, eggs, dairy products—and solid shortenings are the major source of saturated fats. Tropical oils such as coconut oil and palm kernel oil are also rich in saturated fats. Health experts believe these fats contribute significantly to heart disease and other health problems.

Polyunsaturated fats and monounsaturated fats are liquid at room temperature.

Although too much of any kind of fat is unhealthy, these fats are considered more healthful than saturated fats. Polyunsaturated fats are found in vegetable oils such as corn oil, safflower oil, sunflower oil, and cottonseed oil. High levels of monounsaturated fats are found in olive oil and canola oil. Both kinds of unsaturated fats are found in other plant products as well, including whole grains, nuts, and some fruits and vegetables.

One group of saturated fats of special concern is **trans fats**. These fats occur naturally in small amounts only. Most of the trans fats in our diet are from manufactured fats subjected to a process called ***hydrogenation***. ***Hydrogenated fats*** are fats changed from liquid to solid by adding hydrogen atoms to the fat molecules. This is the process used to make products such

TABLE 5.1 Major Nutrients

Nutrient	Major Dietary Sources	Functions in the Body
Carbohydrates	Grains (including breads and pasta) Dried beans Potatoes Corn Sugar	Major source of energy (calories) for all body functions. Necessary for proper utilization of fats. Unrefined carbohydrates supply fiber, important for proper waste elimination.
Fats	Meats, poultry, and fish Dairy products Eggs Cooking fats and shortening Salad dressings	Supply food energy (calories). Supply essential fatty acids. Carry fat-soluble vitamins.
Proteins	Meats, poultry, and fish Milk and cheese Eggs Dried beans and peas Nuts	Major building material of all body tissues. Supply food energy (calories). Help make up enzymes and hormones, which regulate body functions.
Vitamin A	Liver Butter and cream Egg yolks Green and yellow vegetables and fruits	Helps skin and mucous membranes resist infection. Promotes healthy eyes and makes night vision possible.
Thiamin (vitamin B_1)	Pork Whole grains and fortified grains Nuts Legumes Green vegetables	Needed for utilization of carbohydrates for energy. Promotes normal appetite and healthy nervous system. Prevents beriberi.
Riboflavin (vitamin B_2)	Organ meats Milk products Whole grains and fortified grains	Needed for utilization of carbohydrates and other nutrients. Promotes healthy skin and eyes.
Niacin (vitamin B_3)	Liver Meat, poultry, and fish Legumes	Needed for utilization of energy foods. Promotes healthy nervous system, skin, and digestion. Prevents pellagra.
Folic acid or folate (vitamin B_9)	Leafy vegetables Legumes Egg yolks Grain products Liver	Needed for cell functions, including cell growth and division and synthesizing and repairing DNA.
Vitamin B_{12}	Most animal and dairy products	Promotes healthy blood and nervous system.
Vitamin C (ascorbic acid)	Citrus fruits Tomatoes Potatoes Dark green leafy vegetables Peppers, cabbage, and broccoli Cantaloupe Berries	Strengthens body tissues. Promotes healing and resistance to infection. Prevents scurvy.
Vitamin D	Fortified milk products Formed in skin when exposed to sunlight	Necessary for utilization of calcium and phosphorus to promote healthy bones, teeth, and muscle tissue.
Vitamin E	Unsaturated fats (vegetable oils, nuts, whole grains, etc.)	Protects other nutrients.
Calcium	Milk products Leafy vegetables Canned fish with bones	Forms bones and teeth. Necessary for healthy muscles and nerves.
Iron	Liver and red meat Raisins and prunes Egg yolks Leafy vegetables Dried beans Whole grains	Needed for formation of red blood cells.

Choosing nutrient-dense foods and avoiding empty calories is necessary in order for us to get adequate nutrition without consuming too many calories in the process. Choose foods that limit the intake of saturated and trans fats, cholesterol, added sugars, salt, and alcohol.

2. **Manage weight.**
To maintain a healthy body weight, balance the calories you consume with the calories you burn. People who are greatly overweight are more likely to develop certain chronic diseases, including high blood pressure, heart disease, and stroke. People who consume more calories than they burn off will gain weight.

To prevent gradual weight gain, make small decreases in the calories you consume and increase your physical activity. Rather than depending on crash diets, it is usually better to lose weight slowly and gradually, to develop better habits of eating, and to increase physical activity. To get all the nutrients you need while cutting down on calories, decrease foods that are high in calories but low in nutrients, especially fat and fatty foods, sugar and sweets, and alcohol.

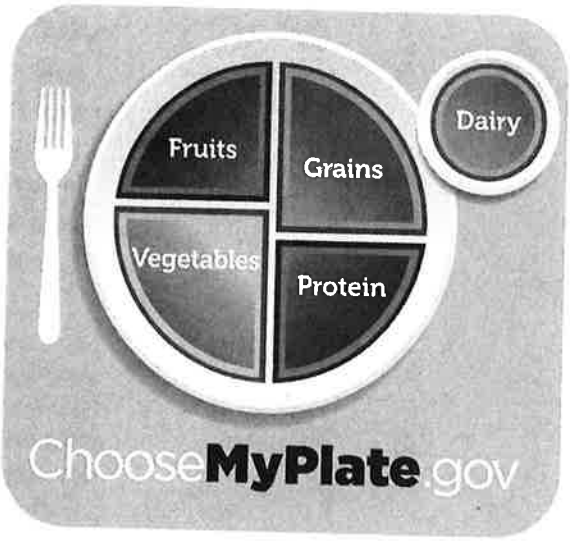

FIGURE 5.1a MyPlate
Courtesy the US Department of Agriculture.

3. **Engage in physical activity.**
Engaging in regular physical activity promotes health, psychological well-being, and a healthy body weight. For general health and reducing the risk of chronic diseases, getting at least 30 minutes of moderately vigorous exercise every day is desirable, and more and longer vigorous exercise can be even more beneficial. In order to avoid gaining weight, adults should try to get 60 minutes of exercise most days while at the same time not consuming too many calories. People who wish to lose weight gradually should try to get 60 to 90 minutes of exercise most days, again while limiting calorie intake.

4. **Select from the right food groups.**
Fruits, vegetables, whole grains, and low-fat or fat-free milk and milk products are the foods with the highest nutrient density. These foods should be strongly emphasized in a healthy diet. In particular, someone who consumes 2,000 calories a day should try to eat the following daily:

- 2 cups (4 servings) fruit, selecting from a variety of fruits
- 2½ cups (5 servings) vegetables, selected from as many of the basic vegetable groups as possible: dark green vegetables, orange vegetables, legumes, starchy vegetables, and others
- 3 servings of whole grains
- 3 cups of fat-free or low-fat milk or its equivalent in other dairy products, such as yogurt and cheese

In the United States, these foods are represented graphically by the icon called MyPlate (Figure 5.1a), developed by the U.S. Department of Agriculture (USDA) as a way to help consumers make healthier food choices. The figure emphasizes the fruit, vegetable, grain, protein, and dairy food groups and represents them in proper proportions on a plate. The sidebar indicates important nutrients supplied by these food groups. Note in particular that proteins take up less than a quarter of the plate. This is in contrast with more traditional platings in which the meat, poultry, or fish item covers about half the plate or more, with vegetable and starch accounting for the rest. The average North American already consumes about twice as much protein as needed in the diet. A goal of MyPlate is to decrease emphasis on high-fat, high-calorie protein items and to add more fruits, vegetables, and grains to the diet.

Consumers are urged to seek more information on portions, portion sizes, and other healthful food options by consulting www.choosemyplate.gov. To help consumers choose the right food groups, the website offers the following tips:

- Balance calories by determining how many you need a day based on age, sex, and level of physical activity, and by increasing your activity.
- Enjoy your food, but eat less.
- Avoid oversized portions.

MYPLATE NUTRIENTS

The five food groups emphasized by the MyPlate icon supply important nutrients that may be lacking in diets high in fatty foods and sweets.

Fruits are low in fat, sodium, and calories, contain no cholesterol, and are good sources of potassium, fiber, vitamin C, and folic acid.

Vegetables are also low in fat, sodium, and calories and contain no cholesterol, and supply potassium, fiber, vitamin A, vitamin C, and folic acid.

Grains are sources of fiber, B vitamins (thiamin, riboflavin, niacin, and folic acid), iron, magnesium, and selenium.

Protein foods are, of course, high in proteins. Foods from this group should be chosen carefully, as many meats and cheeses are high in solid fats, cholesterol, and calories. Egg yolks are also high in cholesterol.

Dairy products are good sources of calcium, potassium, and vitamin D.

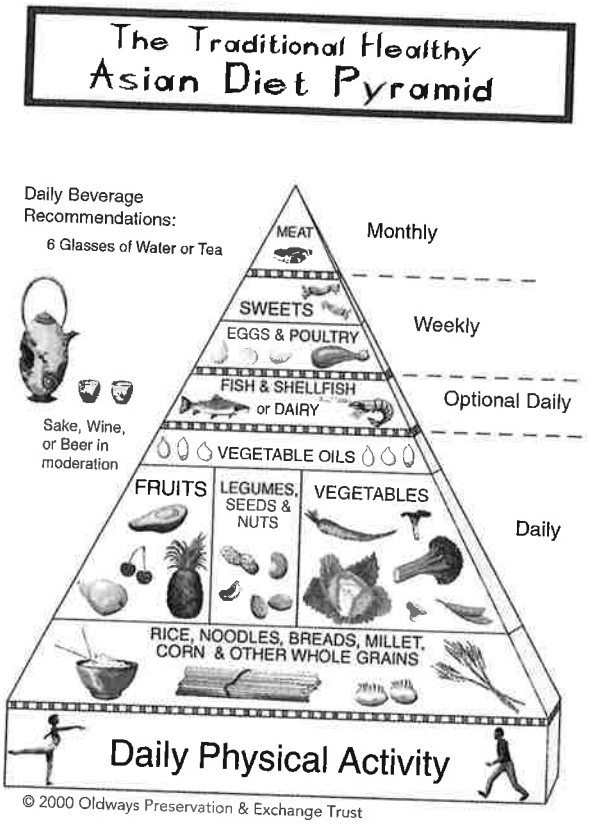

FIGURE 5.1c The traditional healthy Asian diet pyramid.
© 2000 Oldways Preservation & Exchange Trust.

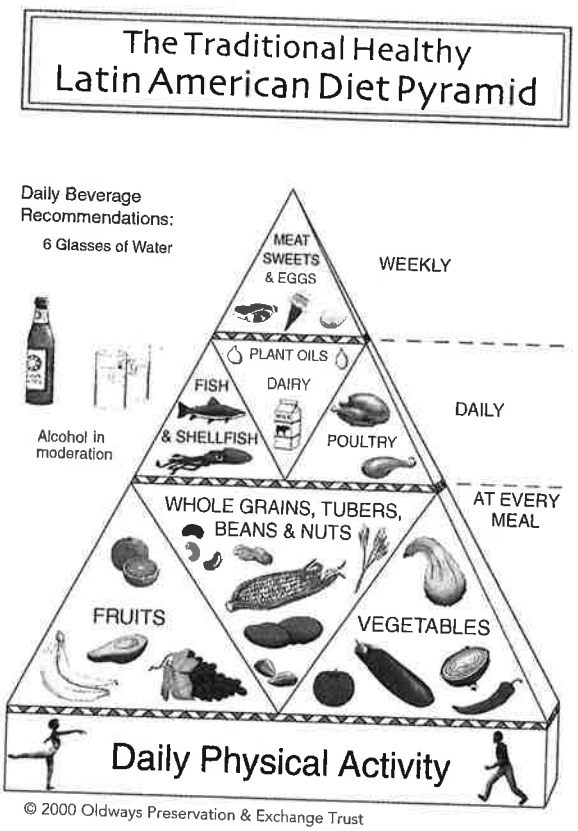

FIGURE 5.1d The traditional healthy Latin American diet pyramid.
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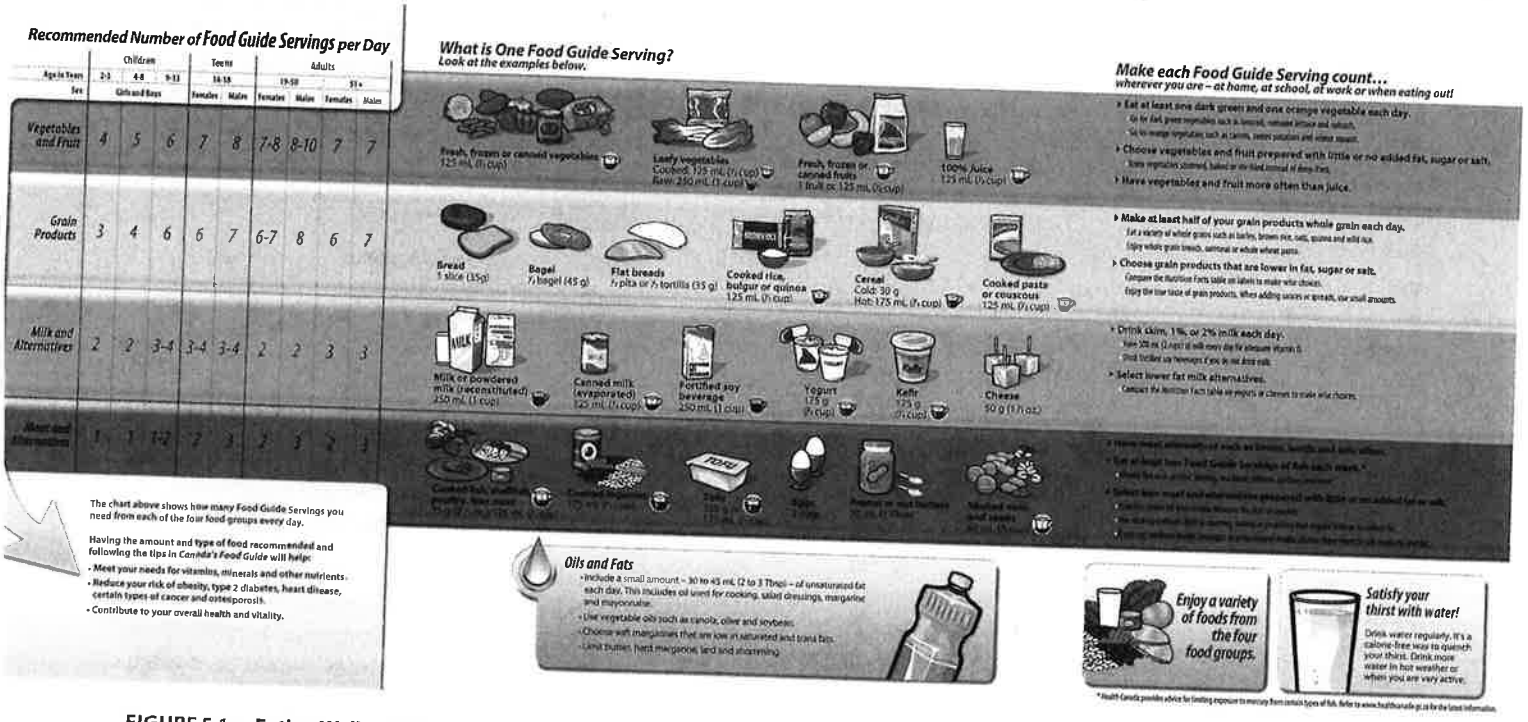

FIGURE 5.1e Eating Well with Canada's Food Guide.
Source: © All rights reserved. *Eating Well with Canada's Food Guide*. Health Canada, 2011. Modified and reproduced with permission from the Minister of Health, 2014.

Remember that serving sizes must be followed closely for this system to work. For example, 2 ounces of turkey on your plate counts as two servings or exchanges. A sandwich consisting of 2 ounces of ham, 1 ounce of cheese, two slices of bread, and 1 tablespoon of mayonnaise contains three protein exchanges, two starch exchanges, and three fat exchanges, as indicated by Table 5.3.

TABLE 5.3 Nutrients per Exchange Group

Exchange Group	Calories	Carbohydrates	Protein	Fat
Starches	80	15 g	3 g	1 g
Fruits	60	15 g	0	0
Vegetables	25	5 g	2 g	0
Proteins	35–145	0	7 g	0–13 g
Dairy	80–150	12 g	8 g	0–8 g
Fats	45	0	0	5 g
Sweets	variable	15 g	variable	variable

COOKING HEALTHFUL MEALS

Restaurateurs and chefs are becoming more and more attentive to people's health and diet concerns. Many of them are reexamining their menus, modifying their cooking practices, and adding new, healthful items to their menus. Some have developed new menus intended to follow as closely as possible the eight recommendations just listed.

An increased health consciousness has affected the way we think about food and the way we cook. Professional cooks are making their foods more healthful in several ways:

1. **Using less fat in cooking.**
   Cooking methods that require no added fat, such as simmering, poaching, baking, steaming, and grilling, can be considered the most healthful.

   For sautéing, nonstick pans are becoming more widely used because little or no fat is needed. With regular pans, one can be careful to use as little fat as possible.

   Grilling is popular because it can be done without first coating the food with fat. If this is done, however, one must be careful not to let the food dry out.

   Using less fat in cooking also means using ingredients with less fat. Excess external fat can be trimmed from meats and poultry. Low-fat sauces, such as salsas and vegetable purées, can often be used instead of high-fat sauces. Recipes can often be modified to reduce quantities of high-fat ingredients, such as butter, cheese, and bacon.
2. **Using unsaturated fats.**
   When you do use fats, try to substitute monounsaturated fats, such as olive oil or canola oil, for saturated fats when appropriate.
3. **Emphasizing flavor.**
   Taste is the most important factor in preparing nutritious food. The most vitamin-packed dish does no one any good if it is uneaten because it doesn't taste good. Preparing flavorful foods requires knowledge of the principles of cooking. You can't rely simply on nutritional information.

   Rely more on the natural flavors of foods and less on salt and other additives that should be decreased in the diet.
4. **Using the freshest, highest-quality foods possible.**
   In order to prepare delicious foods with little or no added salt and with less reliance on high-fat, high-sodium sauces and condiments, it is important to use high-quality natural ingredients at their peak of flavor. Healthful cooking means letting the true flavors of foods dominate.

   To enhance natural flavors without added salt, cooks are using more fresh herbs, hot seasonings such as chiles, ginger, and pepper, and flavorful ingredients like garlic, browned onions, and flavored vinegars.

TERMS FOR REVIEW

calorie
empty calorie
nutrient density
carbohydrate
ketone body
ketosis
fiber
soluble fiber
insoluble fiber
fat
saturated fat
monounsaturated fat
polyunsaturated fat
trans fat
lipid
cholesterol
essential fatty acid
omega-3 fatty acid
protein
complete protein
complementary protein
vitamin
major mineral
trace mineral
low-density lipoprotein (LDL)
high-density lipoprotein (HDL)

QUESTIONS FOR DISCUSSION

1. Describe the difference between foods with empty calories and foods with high nutrient density. Give examples of foods in each category.
2. Why are unrefined carbohydrates more healthful than refined starches and sugars?
3. Why is it necessary to have some fat in the diet?
4. Which vitamins are water-soluble? Which are fat-soluble? Which of the two groups is more important to include in the diet every day? Why?
5. According to the recommendations of government health agencies, which food groups should we consume more of than we now do, on average? Which foods should we consume less of?
6. Discuss and compare the healthful or unhealthful qualities of saturated fats, polyunsaturated fats, and monounsaturated fats. Give examples of each type.
7. What are some ways you, as a cook, can reduce the fat and sodium content of your menu offerings?
8. How can you ensure a nutritionally balanced menu without actually calculating the nutrient content of every item?

NUTRITION 5

Chapter 5 is an introduction to the challenging and often changing study of nutrition. Here you will become familiar with many of the key terms and concepts of this science so that you can better understand how to plan and prepare nutritious, healthful meals and meal choices for your customers or clients.

After studying Chapter 5, you should be able to:

1. **List and describe the six categories of nutrients, explain their functions in the body, and name some food sources of each.**
2. **Define the term *calorie* and describe the relationship between calories and weight gain.**
3. **List and describe the eight guidelines for maintaining a healthful diet.**
4. **Describe ways that cooks can incorporate nutrition principles into their cooking and their menu construction.**

A. Terms

Fill in each blank with the term that is defined or described.

_____ **1.** A food that provides few nutrients per calorie.

_____ **2.** A measure of the relative quantity of nutrients per calorie in a food.

_____ **3.** The amount of heat needed to raise the temperature of 1 kilogram of water by 1°C.

_____ **4.** A food protein that contains all essential amino acids.

_____ **5.** Any disease that is caused by the lack of a particular vitamin.

_____ **6.** A component of some foods that cannot be digested or used by the body but that is important for the proper functioning of the intestinal tract.

_____ **7.** A group of nutrients that includes starches and sugars.

_____ **8.** Two categories of fat that are liquid at room temperature.

_____

_____ **9.** A category of fat that is solid at room temperature.

_____ **10.** Of the three categories of fats listed in numbers 8 and 9, this one is considered the most healthful.

fat: _____

_____

_____

carbohydrate: _____

_____

_____

vitamin C: _____

_____

_____

vitamin A: _____

_____

_____

3. What is the most important function of carbohydrates in the body? _____

_____

4. What is the most important function of proteins in the body? _____

_____

5. Why is it important to include the B vitamins and vitamin C in the diet every day? _____

_____

6. What is the body's major source of the mineral sodium? _____

Why do health experts caution us to cut back on sodium in the diet? _____

_____

7. Give three specific examples of how you, as a restaurant chef, could reduce the fat content of foods that you prepare for your customers. _____

_____

_____

_____

_____

_____