BASIC NUTRITION MODULE

Basic Nutrition Module

Contents

Tables

Figures

Boxes

Introduction

About the Basic Nutrition Module:

The purpose of this module is to provide WIC staff with information about basic nutrition and current dietary guidelines. After completing this module, staff will be able to express an understanding of how healthy food choices, weight maintenance, and physical activity relate to good health. WIC staff will be able to promote these concepts in daily interactions with clients and be aware of ways to make positive changes in their own eating habits and lifestyles.

The Basic Nutrition Module has two components: 1) the Basic Nutrition Module which contains the main text, and 2) the Basic Nutrition Workbook, which contains the activities and test questions.

How to Use the Basic Nutrition Module

This module contains six parts. As you read through each part, the following icons will prompt you to stop and go to your workbook to complete the activities and test questions.

Activity Icon — When you see this icon, stop where you are and complete the corresponding activity in the **Basic Nutrition Workbook.**

Test Icon — When you see this icon in the module, stop and complete the corresponding test questions in the **Basic Nutrition Workbook.**

Terms that appear in **bold type** in the text are defined in the glossary in the back of the module. There is a single Reference List in the back of the module that contains all the references cited throughout the text.

Setting the Stage — Food, Nutrition, and America's Waistline

Part 1

As a nation, Americans are overfed but undernourished — we're eating too many calories, yet we don't always get the nutrients we need. As a result, our country has record high rates of obesity, heart disease, diabetes, and other chronic diseases. Fortunately, there are programs like WIC that can help.

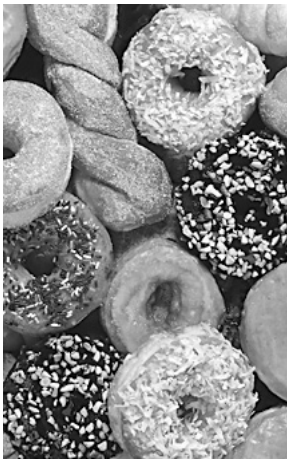
Objectives

After reading Part 1 you'll be able to:

- Identify trends related to the health and lifestyle of Americans.
- Identify specific factors that are leading to weight gain in Americans.
- Define food insecurity and recognize factors that affect it.
- Define the term food desert.
- Recognize the importance of your role as a WIC staff member in promoting healthier lifestyles.

Part 1

The Big Picture



Americans are eating too much saturated fat, sugar, sodium, and calories, and not enough vitamins, minerals, fiber, and beneficial oils. We're snacking on packaged foods full of empty calories rather than eating fresh foods full of wholesome nutrients. And we're eating on the run instead of taking the time to cook at home, savor our foods, and enjoy meals with family. Consider these alarming trends and statistics:

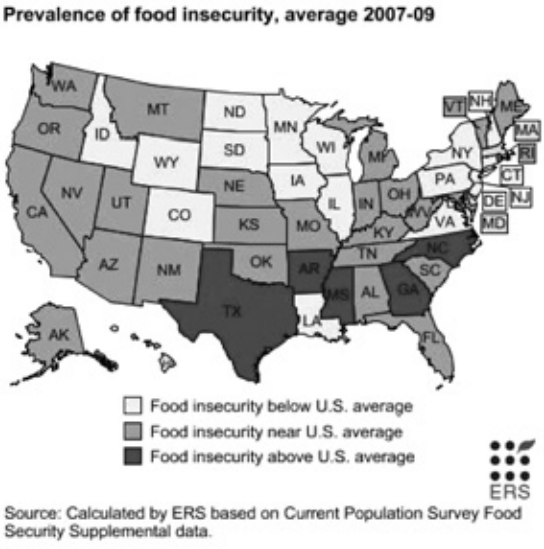
- **Two out of every three American adults are overweight or obese.** About 72% of women and 64% of men in the U.S. are overweight or obese. And many more people are at risk of becoming part of these statistics (United States Department of Agriculture [USDA], 2010a).
- **Most Americans don't get enough regular physical activity.** Many people get none at all. Only 31% of U.S. adults say they are physically active on a regular basis, and research shows that *actual* activity is much lower than what people report (Troiano et al., 2008).
- **Being overweight or obese puts people at risk for chronic diseases,** including high blood pressure, heart disease, and type 2 diabetes. Poor dietary habits have also been linked to osteoporosis and some types of cancer. According to USDA, the number of deaths related to poor diet and physical inactivity is increasing and may soon overtake tobacco use as the leading preventable cause of death (USDA, 2010b).
- **America's children are learning by example.** The prevalence of overweight and obesity has practically *doubled* among younger children, and *tripled* among adolescents since the early 1970s. Like adults, kids are eating too many calories, fats and sugars. The top three sources of calories among kids are grain-based desserts (cookies, cakes, pies, pastries, etc.), pizza, and high-sugar sodas and energy drinks (USDA, 2010a).
- **Americans spend 45% less time preparing food at home than before.** Processed and packaged foods crowd supermarket shelves, more fast food is available, and Americans are eating away from home more often than before. That means we're getting more salt, saturated fat, and additives compared to what we would get if we cooked most of our foods at home from scratch (USDA, 2010b).

- **Portion sizes have ballooned along with everything else.** Today, you can buy a 64-ounce "Mega Jug" soda, which will load you down with 780 calories and 217 grams of sugar. This is *10 times* the size of an original 6.5 ounce Coca-Cola bottle. Worse yet, fast food restaurants and convenience stores typically offer the large-size portion for just pennies more than the medium-size serving, giving consumers more food for their money. But as we know, more is not always better.

Food Economics and Nutrition

Even though our country is plagued with overweight, obesity, and overconsumption, there are still millions of people in the U.S who are "food insecure." **Food insecurity** means there are times during the year that a person may not have enough money or other resources to get the food they need. During 2009, 17.4 million of all U.S. households (14.7 %) were food insecure at some point during the year (Nord, Coleman-Jensen, Andrews, & Carlson, 2010). Texas is one of five states with a food insecurity rate *higher* than the national average (see Figure 1.1).

Figure 1.1 Prevalence of Food Insecurity, average 2007-09



Source: Calculated by ERS based on Current Population Survey Food Security Supplemental data.

Food insecurity is closely tied to household income. Based on 2009 statistics, 43% of households below the poverty line had a difficult time putting enough food on the table at some point during the year. Also, 57% of food-insecure households said that they had taken part in the Supplemental Nutrition Assistance Program (SNAP), The National School Lunch Program, and/or WIC during the previous month (Nord et al., 2010).

Geographic location can also affect a family's nutrition. Some Americans live in **food deserts** – large geographic areas that don't have reasonable access to affordable fruits, vegetables, whole grains, low-fat milk, or other healthy foods. Food deserts can be in inner city or rural settings, often in areas where residents have fairly low incomes. In some food deserts, the closest and easiest places to get food are fast food chains or convenience stores. People living in food deserts are in need of healthier food options (Centers for Disease Control and Prevention [CDC], 2010b).

The Good News

Many Americans are changing their eating habits and becoming more active.

While the big picture looks bleak, America's nutritional health is not a lost cause. Many people are making healthier choices like cooking at home more often, walking during work breaks, planting gardens, exercising with friends, and playing outside with the kids. And we are not all statistics — many Americans are already at a healthy weight or working toward a healthy weight.

Communities and governments are creating initiatives to help improve people's nutrition and fitness. Cities are adding walking and biking trails and offering recreation programs for kids and cooking classes for adults. Schools are working with farmers markets and chefs to include more locally grown produce on their lunch menus. National programs like "Marathon Kids" and "Let's Move America" encourage families to be more active, eat more fruits and vegetables, and have better access to healthy foods. New federal laws require many restaurants and vending machines to provide nutrition information for foods items.

WIC's Commitment

As one of USDA's nutrition assistance programs, WIC helps to promote health and improve food security by providing healthy food items to eligible women, infants, and children. In 2009, the program added fruits, vegetables, and whole grains to the list of WIC foods. WIC also started offering extra food incentives to mothers who fully breastfeed their infants as a way to encourage more moms to make this healthy choice.

Of course, WIC does much more than provide supplemental foods — nutrition education is a huge component of the program. WIC staff members focus on educating and motivating participants to live a healthy lifestyle. WIC encourages participants to eat more fruits, vegetables and whole grains; cut down on fat and sugar; be more active; breastfeed their infants; model healthy lifestyles for their families; and follow eating patterns that are in line with the latest dietary guidelines.

What is Your Role?

So what does all this mean to you, a staff member in a Texas WIC clinic? First, remember that *you* are an important resource for WIC participants. You can make a difference in the lives of many Texas families by helping participants learn practical food and nutrition tips that they will use every day. You can provide them with healthy foods so they can be more food secure each month; you can help participants understand the benefits of breastfeeding; and you can help them learn how their diet and physical activity choices can affect their health and their children's health. This module is the first step toward learning the nutrition basics you need to know in order to be an important resource for participants.

But there is something more to consider about your role as a WIC staff member: *your own health*. As you go through this module, we challenge you to think honestly about *yourself*. Look at your own eating habits, your own activity level and other choices you make each day. Take this opportunity to start your own lifetime journey toward wellness. In the end, we hope this module helps you make healthy changes in your own life as well as the lives others.

Part 1 Test: This is the end of Part 1. Go to your Basic Nutrition Workbook to complete Part 1 test questions.

Nutrient Basics

Part 2

Nourishing ourselves is no small task — it takes over 45 nutrients to keep our bodies going every day. In this section, we will introduce the different categories of nutrients and also discuss some practical aspects, like how to tell what nutrients are in your food, and how to keep a one-day food record.

Objectives

After reading this section you'll be able to:

- Identify the six major categories of nutrients.
- Understand which nutrients provide calories.
- Recognize which factors can influence a person's nutrient needs.
- Practice using a food diary to record your food intake.
- Demonstrate how to read and analyze a food label.

Part 2

The Nutrients

The nutrients our body needs are grouped into six major categories:

- **Carbohydrates** are the body's major source of energy (calories). Current guidelines suggest 45-65% daily calories should come from carbohydrates.
- **Fats** transport nutrients and are an important part of the cell structure. Fats also contribute calories — lots of them. Many Americans eat too many saturated and trans fats, raising their risk of cardiovascular disease. Experts recommend that 20-35% of our calories come from fat.
- **Proteins** are made up of amino acids that the body uses to build, repair, and maintain tissues. Most Americans get plenty of protein each day. The latest guidelines advise getting 10-35% of our calories from protein each day.
- **Vitamins** are present in foods in small quantities, yet they have big jobs, helping with chemical reactions in the body. Vitamins don't provide calories, but they help the body *use* calories from carbohydrates, proteins and fat. In this module, we'll focus on vitamin A, vitamin C, vitamin D, and folic acid.
- **Minerals** are similar to vitamins in that they are present in tiny quantities, they don't provide calories, and they play specific roles in body functions. In this module we'll cover iron, calcium, sodium, and potassium.
- **Water** is an essential part of the diet. Water is part of every fluid in the body; it carries nutrients and oxygen, carries out waste, and normalizes our body temperature. Our bodies can survive for six to eight weeks without food, but a healthy adult can't make it more than 3 to 5 days without water (Bryant, 2008).

Table 2.1 Nutrient Needs Based on Age and Gender (USDA, 2010a)

This table does not include data for pregnant or breastfeeding women.
A copy of this table is available in the Appendix of your Basic Nutrition Workbook.

Macronutrients

Nutrient (units)	Source of Goal[a]	Child 1–3	Female 4–8	Male 4–8	Female 9–13	Male 9–13	Female 14–18	Male 14–18	Female 19–30	Male 19–30	Female 31–50	Male 31–50	Female 51+	Male 51+
Protein (g)	RDA[b]	13	19	19	34	34	46	52	46	56	46	56	46	56
(% of calories)	AMDR[c]	5–20	10–30	10–30	10–30	10–30	10–30	10–30	10–35	10–35	10–35	10–35	10–35	10–35
Carbohydrate (g)	RDA	130	130	130	130	130	130	130	130	130	130	130	130	130
(% of calories)	AMDR	45–65	45–65	45–65	45–65	45–65	45–65	45–65	45–65	45–65	45–65	45–65	45–65	45–65
Total fiber (g)	IOM[d]	14	17	20	22	25	25	31	28	34	25	31	22	28
Total fat (% of calories)	AMDR	30–40	25–35	25–35	25–35	25–35	25–35	25–35	20–35	20–35	20–35	20–35	20–35	20–35
Saturated fat (% of calories)	DG[e]	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%	<10%
Linoleic acid (g)	AI[f]	7	10	10	10	12	11	16	12	17	12	17	11	14
(% of calories)	AMDR	5–10	5–10	5–10	5–10	5–10	5–10	5–10	5–10	5–10	5–10	5–10	5–10	5–10
alpha-Linolenic acid (g)	AI	0.7	0.9	0.9	1.0	1.2	1.1	1.6	1.1	1.6	1.1	1.6	1.1	1.6
(% of calories)	AMDR	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2	0.6–1.2
Cholesterol (mg)	DG	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300

Minerals

Nutrient (units)	Source of Goal[a]	Child 1-3	Female 4-8	Male 4-8	Female 9-13	Male 9-13	Female 14-18	Male 14-18	Female 19-30	Male 19-30	Female 31-50	Male 31-50	Female 51+	Male 51+
Calcium (mg)	RDA	700	1,000	1,000	1,300	1,300	1,300	1,300	1,000	1,000	1,000	1,000	1,200	1,200
Iron (mg)	RDA	7	10	10	8	8	15	11	18	8	18	8	8	8
Magnesium (mg)	RDA	80	130	130	240	240	360	410	310	400	320	420	320	420
Phosphorus (mg)	RDA	460	500	500	1,250	1,250	1,250	1,250	700	700	700	700	700	700
Potassium (mg)	AI	3,000	3,800	3,800	4,500	4,500	4,700	4,700	4,700	4,700	4,700	4,700	4,700	4,700
Sodium (mg)	UL[g]	<1,500	<1,900	<1,900	<2,200	<2,200	<2,300	<2,300	<2,300	<2,300	<2,300	<2,300	<2,300	<2,300
Zinc (mg)	RDA	3	5	5	8	8	9	11	8	11	8	11	8	11
Copper (mcg)	RDA	340	440	440	700	700	890	890	900	900	900	900	900	900
Selenium (mcg)	RDA	20	30	30	40	40	55	55	55	55	55	55	55	55

Vitamins

Nutrient (units)	Source of Goal[a]	Child 1-3	Female 4-8	Male 4-8	Female 9-13	Male 9-13	Female 14-18	Male 14-18	Female 19-30	Male 19-30	Female 31-50	Male 31-50	Female 51+	Male 51+
Vitamin A (mcg RAE)	RDA	300	400	400	600	600	700	900	700	900	700	900	700	900
Vitamin D[h] (mcg)	RDA	15	15	15	15	15	15	15	15	15	15	15	15	15
Vitamin E (mg AT)	RDA	6	7	7	11	11	15	15	15	15	15	15	15	15
Vitamin C (mg)	RDA	15	25	25	45	45	65	75	75	90	75	90	75	90
Thiamin (mg)	RDA	0.5	0.6	0.6	0.9	0.9	1.0	1.2	1.1	1.2	1.1	1.2	1.1	1.2
Riboflavin (mg)	RDA	0.5	0.6	0.6	0.9	0.9	1.0	1.3	1.1	1.3	1.1	1.3	1.1	1.3
Niacin (mg)	RDA	6	8	8	12	12	14	16	14	16	14	16	14	16
Folate (mcg)	RDA	150	200	200	300	300	400	400	400	400	400	400	400	400
Vitamin B_6 (mg)	RDA	0.5	0.6	0.6	1.0	1.0	1.2	1.3	1.3	1.3	1.3	1.3	1.5	1.7
Vitamin B_{12} (mcg)	RDA	0.9	1.2	1.2	1.8	1.8	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Choline (mg)	AI	200	250	250	375	375	400	550	425	550	425	550	425	550
Vitamin K (mcg)	AI	30	55	55	60	60	75	75	90	120	90	120	90	120

a Dietary Guidelines recommendations are used when no quantitative Dietary Reference Intake value is available; apply to ages 2 years and older.
b Recommended Dietary Allowance, Institute of Medicine (IOM).
c Acceptable Macronutrient Distribution Range, IOM.
d 14 grams per 1,000 calories, Institute of Medicine.
e Dietary Guidelines recommendation.
f Adequate Intake, IOM.
g Upper Limit, IOM.
h 1 mcg of vitamin D is equivalent to 40 IU.
AT = alpha-tocopherol; DFE = dietary folate equivalents; RAE = retinol activity equivalent.

Part 2

How Much of Each Nutrient do People Need?

Scientists routinely look at the latest research to come up with nutrient recommendations for people in different age groups. *Individual* nutrient needs depend on your age, sex, height, weight, and physical activity, as well as your health status. Table 2.1 lists nutrient needs based on age and gender.

Which Nutrients Provide Calories?

Only three types of nutrients provide calories: *carbohydrates*, *proteins*, and *fats*. Most foods and drinks have combinations of these nutrients in different amounts. *Alcohol* also provides calories. Alcohol isn't a nutrient since our bodies don't need it to function, but alcoholic beverages can add a lot of calories to a diet.

Making Sense of Calories

Simply put, a calorie is a unit of energy. The number of calories in a food tells you how much energy that food provides. For example, an apple provides about 100 calories that your body can use for energy.

We also refer to calories when we talk about how much energy our bodies use or "burn." Example: if you walk 3.5 miles in an hour, you'll burn about 280 calories.

Sources of Calories in the Diet:

- Carbohydrate has 4 calories/gram
- Protein has 4 calories/gram
- Fat has 9 calories/gram
- Alcohol has 7 calories/gram

Notice that fat has more than twice the calories per gram compared to protein or carbohydrate. To help picture this, compare the teaspoons of sugar and oil in Figure 2.1. Because the oil is pure fat, it has almost three times the calories of a teaspoon of sugar. That's why butter, sauces, gravies, salad dressings, and other high-fat foods add so many calories to our diets.

Figure 2.1 Carbohydrate Calories Versus Fat Calories

1 teaspoon of sugar weighs 4 grams

4 grams of carbohydrate x 4 calories per gram = 16 calories

1 teaspoon of oil weighs 5 grams

5 grams of fat x 9 calories per gram = 45 calories

Try this! Use Mayo Clinic's On-line Calorie Calculator (optional)

The Mayo Clinic has created an online calorie calculator that tells you how many calories you need each day, and also shows how different levels of physical activity affect your calorie needs. Try it out! Go to http://www.mayoclinic.com/health/calorie-calculator/NU00598

How Many Calories do People Need?

A person needs calories for all their body functions (breathing, sleeping, eating, digesting, walking, running, etc). Most women need between 1600 to 2400 calories per day, and most men need between 2400 to 3000 calories a day. But energy needs vary between people based on gender, age, medical conditions, physical activity and other factors. For example, athletes require more energy than non-active people. Pregnant and breastfeeding women need more calories than non-pregnant women. Calorie needs are lower as we get older. After age 30, calorie needs decrease about 5% each decade. The good news is that the more you know about food, calories, and physical activity, the more prepared you'll be to make positive changes. Table 2.2 shows the estimated number of calories a person needs each day based on age, gender, and physical activity.

Table 2.2 Estimated Calorie Needs Based on Age, Gender and Activity Level (USDA, November 2010)

This table does not include data for pregnant or breastfeeding women.
A copy of this table is available in the Appendix of your Basic Nutrition Workbook.

Estimated amounts of calories[a] needed to maintain calorie balance for various gender and age groups at three different levels of physical activity. The estimates are rounded to the nearest 200 calories. An individual's calorie needs may be higher or lower than these average estimates.

Age (years)						
Gender/ Activity Level[b]	Male/ Sedentary	Male/ Moderately Active	Male/Active	Female[c]/ Sedentary	Female[c]/ Moderately Active	Female[c]/Active
2	1,000	1,000	1,000	1,000	1,000	1,000
3	1,200	1,400	1,400	1,000	1,200	1,400
4	1,200	1,400	1,600	1,200	1,400	1,400
5	1,200	1,400	1,600	1,200	1,400	1,600
6	1,400	1,600	1,800	1,200	1,400	1,600
7	1,400	1,600	1,800	1,200	1,600	1,800
8	1,400	1,600	2,000	1,400	1,600	1,800
9	1,600	1,800	2,000	1,400	1,600	1,800
10	1,600	1,800	2,200	1,400	1,800	2,000
11	1,800	2,000	2,200	1,600	1,800	2,000
12	1,800	2,200	2,400	1,600	2,000	2,200
13	2,000	2,200	2,600	1,600	2,000	2,200
14	2,000	2,400	2,800	1,800	2,000	2,400
15	2,200	2,600	3,000	1,800	2,000	2,400
16	2,400	2,800	3,200	1,800	2,000	2,400
17	2,400	2,800	3,200	1,800	2,000	2,400
18	2,400	2,800	3,200	1,800	2,000	2,400
19–20	2,600	2,800	3,000	2,000	2,200	2,400
21–25	2,400	2,800	3,000	2,000	2,200	2,400
26–30	2,400	2,600	3,000	1,800	2,000	2,400
31–35	2,400	2,600	3,000	1,800	2,000	2,200
36–40	2,400	2,600	2,800	1,800	2,000	2,200
41–45	2,200	2,600	2,800	1,800	2,000	2,200
46–50	2,200	2,400	2,800	1,800	2,000	2,200
51–55	2,200	2,400	2,800	1,600	1,800	2,200
56–60	2,200	2,400	2,600	1,600	1,800	2,200
61–65	2,000	2,400	2,600	1,600	1,800	2,000
66–70	2,000	2,200	2,600	1,600	1,800	2,000
71–75	2,000	2,200	2,600	1,600	1,800	2,000
76+	2,000	2,200	2,400	1,600	1,800	2,000

a. Based on Estimated Energy Requirements (EER) equations, using reference heights (average) and reference weights (healthy) for each age-gender group. For children and adolescents, reference height and weight vary. For adults, the reference man is 5 feet 10 inches tall and weighs 154 pounds. The reference woman is 5 feet 4 inches tall and weighs 126 pounds. EER equations are from the Institute of Medicine. Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids. Washington (DC): The National Academies Press; 2002.
b. Sedentary means a lifestyle that includes only the light physical activity associated with typical day-to-day life. Moderately active means a lifestyle that includes physical activity equivalent to walking about 1.5 to 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life. Active means a lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the light physical activity associated with typical day-to-day life.
c. Estimates for females do not include women who are pregnant or breastfeeding.

Source: Britten P, Marcoe K, Yamini S, Davis C. Development of food intake patterns for the MyPyramid Food Guidance System. J Nutr Educ Behav 2006;38(6 Suppl):S78-S92.

Which Nutrients are in Your Foods?

Are you ever curious about how much sodium is in your soup? Is vitamin A in apricots? How much calcium is in kale? Learning the nutrient content of your favorite foods can take a bit of detective work. Two important tools you can use are:

- USDA's National Nutrient Database.
- The Nutrition Facts Labels on packaged foods.

USDA's National Nutrient Database for Standard Reference

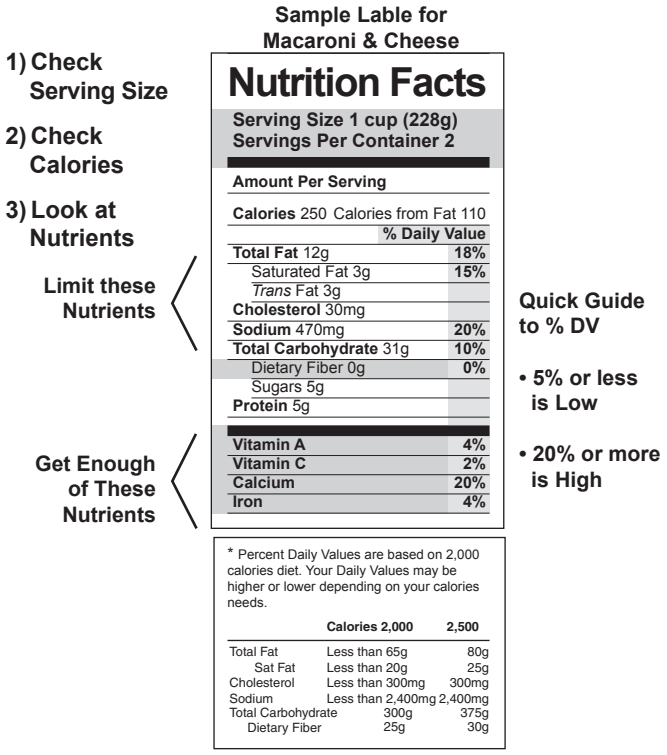
USDA's online tool provides data for research, nutrition monitoring, food policy development, and daily nutrient tracking. It is the foundation of most food and nutrition databases in the U.S. To use this database, simply type in the name a food, and follow the steps. The end result is a detailed report of all the nutrients in the serving sizes of the food that you selected. The database is available at: http://www.nal.usda.gov/fnic/foodcomp/search/.

Activity 2.1 — Using the USDA Nutrient Database. Stop here and go to your Basic Nutritin Workbook and complete the activity.

The Nutrition Facts Label

Most packaged foods in today's grocery stores must have a Nutrition Facts Label. The label tells you the nutrients in a food and shows how a serving of the food contributes to your daily nutrient needs. Although most people are familiar with what the label looks like, many still aren't sure how to properly read it. Box 2.1 breaks the process down into four easy steps.

Box 2.1 Reading a Label in 4 Easy Steps (Adapted from U.S. FDA, 2011a)



4) Read the ingredients list.

Ingredients: ENRICHED MACARONI PRODUCT (WHEAT FLOUR, NIACIN, FERROUS SULFATE [IRON], THIAMIN MONONITRATE [VITAMIN B1], RIBOFLAVIN [VITAMIN B2], FOLIC ACID); CHEESE SAUCE MIX (WHEY, WHEY PROTEIN CONCENTRATE, GRANULAR CHEESE [MILK, CHEESE CULTURE, SALT, ENZYMES], CHEDDAR CHEESE [MILK, CHEESE CULTURE, SALT, ENZYMES], SALT, MODIFIED FOOD STARCH, SODIUM TRIPOLYPHOSPHATE, CREAM, CITRIC ACID, SODIUM PHOSPHATE, CELLULOSE GEL, CELLULOSE GUM, BETA CAROTENE [COLOR]) CONTAINS: WHEAT, MILK.

Image adapted from (U.S. FDA, 2011a)

How to Read a Label in 4 Easy Steps!

Step 1 – Check the serving size and compare it to what you normally eat. The label lists the nutrients in just one serving of the food. Many packages contain more than one serving, and sometimes people eat more than one serving.

Step 2 – Check the calories. This is the number of calories in *one serving* of the food. So before you eat a food, consider how many servings — and how many calories — you plan to eat.

Step 3 – Look at the nutrients. The % **Daily Value** column is a guide to the nutrients in a serving of the food. In other words, it tells you how much a serving of the food contributes to your daily recommended intake. For example, a serving of this macaroni and cheese provides 20% of the Daily Value for calcium.

A daily value of 5% or less means that the food is *low* in a nutrient, while 20% or more means the food is *high* in a nutrient.

Step 4 – Read the ingredients list. The ingredients list is often below the Nutrition Facts label. It lists the items in the food by weight, from greatest to least, and can be helpful when checking for sources of added sugars, fat, whole grains or food allergens. For example, the first ingredient in the macaroni and cheese reads “enriched macaroni product.”

When checking a food label, use these tips to help you make the best choices:

Aim for less:

- saturated fat
- trans fat
- cholesterol
- sodium
- sugar

Aim for more:

- iron
- fiber
- calcium
- vitamin A
- vitamin C

Tracking Nutrient Intake with a Food Record

Do you ever stop to think about the foods you eat? How do you know if you are getting enough nutrients? One way to find out is to write down all the foods you eat using a food record. Then you can analyze the record using a free computerized diet analysis program like the one available at www.ChooseMyPlate.gov.

Writing down everything you eat in a food record helps you think twice about what kinds of foods you put into your body. This is what makes a food record such a powerful tool! You don't have to stop at one day — keeping a food record for a longer time can help you make small dietary changes. You can encourage your clients to become more mindful of their eating habits by creating their own food record.

Activity 2.2 — Keep a One-Day Food Record. Refer to your Basic Nutrition Workbook and complete the activity.

Part 2 Test: This is the end of Part 2. Go to your Basic Nutrition Workbook to complete Part 2 test questions.

Carbohydrates, Fats, and Proteins

Part 3

Carbohydrates, fats, and proteins often take center stage when we discuss diet and nutrition. They are the three major nutrients in our diet that provide energy (or calories), and we usually talk about foods based on their carbohydrate, fat, or protein content.

Objectives

After reading this section you'll be able to:

- Identify sources and benefits of carbohydrates in the diet.
- Recognize food sources of saturated fats, trans fats, and omega-3 fats.
- Distinguish between the effects of solid fats and beneficial oils.
- List food sources of dietary cholesterol.
- Demonstrate knowledge regarding the functions, sources, and dietary requirements for protein.

Part 3

Carbohydrates, Fats, and Proteins: Finding the Right Balance

It's important to eat a healthy balance of carbohydrates, fats, and proteins. Over the years, popular diet plans have made different claims about how much of each nutrient we should eat, especially when it comes to losing weight. But a long-term diet that goes overboard or skimps on one of these major nutrients can lead to trouble.

The Institute of Medicine has published acceptable ranges for carbohydrates, fats and proteins, based on scientific research (USDA, 2010a). Here are the ranges for adults, age 19 years and older:

- 45 - 65% of calories from carbohydrates.
- 20 - 35% of calories from fats.
- 10 - 35% of calories from proteins.

These ranges offer sound guidance along with some flexibility. For example, someone who wants to follow a lower-fat diet can choose to consume only 20% of calories from fats, and increase the percent of calories from proteins and carbohydrates. It is not recommended to go above or below the ranges without guidance from a health-care professional.

Box 3.1: Putting Dietary Ranges into Practice

How do these percentages apply to your daily intake? Based on current guidelines, if you eat 1800 calories a day and would like to follow a diet that contains 55% calories from carbohydrate, 25% calories from fat, and 20% calories from protein, your daily consumption would look like this:

- **Carbohydrates: 248 grams (or 990 calories from Carbohydrates)**

  Calculations:

  1800 calories x 55% = 990 calories from carbohydrate

  990 calories ÷ 4 calories per gram of carbohydrate = 248 grams of carbohydrates

- **Fats: 50 grams (or 450 calories from Fats)**

  Calculations:

  1800 calories x 25% = 450 calories from fat

  450 calories ÷ 9 calories per gram of fat = 50 grams of fats

- **Proteins: 90 grams (or 360 calories from Proteins)**

  Calculations:

  1800 calories x 20% = 360 calories from protein

  360 calories ÷ 4 calories per gram of protein = 90 grams of protein

Carbohydrates

Thanks to carbohydrates, you have the energy to walk, run, breathe, and read this module. That's because the primary role of carbohydrates is to **provide energy**, especially for your brain and nervous system. Each gram of carbohydrate in a food provides 4 calories that your body can use for energy.

Carbohydrates have gotten a bad rap over the years. People blame their extra weight on too many "carbs" and talk about carbohydrates negatively. But not all carbohydrates are created the same. Granted, we need to cut back on less healthy carbohydrates like cookies, candy, cake and other grain-based desserts, but our body needs other healthy carbohydrates. Let's take a closer look at the different types of carbohydrates and their common food sources:

- **Naturally-present sugars –** in fruits, milk products, and some vegetables
- **Added sugars –** in candy, baked goods, sweetened dairy products, etc.
- **Starches –** primarily in grains, vegetables, and legumes
- **Fiber –** found in all plant products including grains, vegetables, fruits, and legumes

Naturally-Present Sugars

Many sugars are *naturally* present in foods like the sugars in fruit, fruit juice, certain vegetables, and milk products. Sadly, some people on extreme weight-loss diets will cut these foods out of their diets simply because they contain sugar. But the fact is, these foods provide important vitamins, minerals, and other key nutrients, while adding balance and variety to a healthy diet.

Carbohydrates like whole grains, fruits, vegetables, and dried beans and peas are full of nutrients your body needs.

Added Sugars

Sugars that are *added* to food are the real culprits when it comes to excess calories and weight gain. Many Americans eat too many added sugars, usually in the form of soft drinks, energy drinks, candy, cakes, cookies, pies, fruit drinks, sugary cereals, and sweetened milk products like ice cream, yogurts, and chocolate milk. Not only do these foods load you down with extra sugar and calories, but they are often poor sources of vitamins, minerals and fiber.

What about sweeteners that manufacturers claim to be “natural”, like raw sugar, evaporated cane juice and brown rice syrup? These may be less refined than table sugar, but they’re still sugars that manufacturers *add* to products. In other words, a brownie is still a brownie, whether it is made with table sugar or brown rice syrup. Your body breaks down *all* the sugars you eat to glucose, regardless if it’s from fruit, milk or candy. So instead of looking at the type of added sugar, it’s best to focus on how nutritious the food is overall.

Check Food Labels and Ingredient Lists

The Nutrition Facts Label provides information on total sugars per serving, but it won’t tell you if the sugars are naturally present or if they are added sugars. You need to check the ingredients lists on packages to look for added sugars. This can take some detective work, as many added sugars have scientific names. Here are some common **added sugars** that you might see in ingredients lists:

Brown Sugar	Corn Syrup	Dextrose
Fructose	Sugar	Lactose
Honey	Invert Sugar	Mannitol
Maltose	Malt Syrup	Raw Sugar
Molasses	Nectars	Syrup
Sucrose	High Fructose Corn Syrup	

What’s the best advice for sugars?

Cut back on foods and drinks that contain added sugars, since they tend to be less nutritious. That means less candy, cakes, cookies, pies, regular soft drinks, fruit punch, ice cream and sweet rolls, to name a few. Also, take it easy on fruit juice. Even though the sugar in juice is naturally present, there’s a lot of it. In fact, an 8-ounce glass of juice has about the same amount of sugar as an 8-ounce glass of regular soda. If you really want to enjoy some natural sweetness, have a piece of fruit instead — you’ll get less sugar, fewer calories and more fiber.

Activity 3.1 — Added Sugars Reality Check
Refer to your Basic Nutrition Workbook and complete the activity.

Starches

Technically speaking, starches are just simple sugars linked together into longer chains. Our bodies break starches down to simple sugars, and then to glucose for energy. Starchy foods include potatoes, yams, breads, corn and other grains. Dieters often avoid starchy foods, but it's based on misguided information as many starchy foods are full of nutrients. Potatoes are one of the top sources of potassium, corn is a whole grain food, and breads, cereals and pasta made from whole grain flour contain fiber. The key is to enjoy these foods in variety and moderation, keeping in mind healthy recipes and cooking methods.

Fiber

All plant foods contain fiber: grains, fruits, vegetables, beans, and nuts. Our bodies cannot digest fiber, which is what makes it so beneficial. Fiber acts like a sponge in the digestive tract, absorbing water as it travels. This adds bulk and softness to the stool, helping with problems like constipation, hemorrhoids and diverticulitis. And even more importantly, fiber can lower your risk of heart disease and help maintain normal blood glucose levels, lowering your risk of diabetes (Higdon, 2005). Table 3.1 shows the amount of fiber in different foods. Most adults need between 21 to 38 grams of fiber each day, or about 14 grams for every 1000 calories. Here are suggestions for adding fiber to your diet:

- Make half your grains whole grains.
- Eat whole fruit rather than drinking fruit juice.
- Include at least two vegetables with your evening meal.
- Prepare raw veggies and store them in your refrigerator for a quick snack as part of your lunch or to add to a salad. Try carrots, sweet peppers, cucumbers, or celery. Check www.fruitsandveggiesmatter.gov for more ideas.
- Use beans instead of meat several times a week. Dried beans and peas are full of fiber, protein and other nutrients.

- Enjoy oatmeal or whole-grain breakfast cereal in the morning. Put fruit on top for even more fiber and nutrients.
- Choose fiber-rich foods rather than fiber supplements. Foods provide vitamins, minerals and other nutrients that are not in supplements. However, some people with digestive issues may benefit from fiber supplements. Talk with your health-care provider if you have questions about fiber supplements.
- Remember to drink more fluids when you add fiber to your diet. Too much fiber without enough fluid can lead to constipation and discomfort.

Table 3.1 Approximate Fiber Content of Various Foods

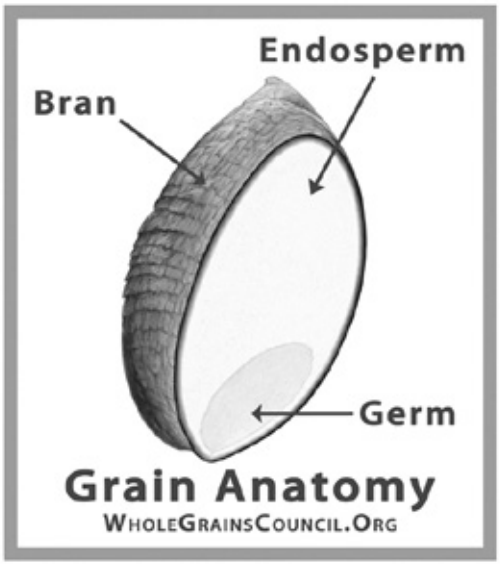
(Adapted from Dietary Guidelines for Americans, 2010)

Food	Dietary Fiber (grams)	% Daily Value
Dried Beans & Legumes, cooked, ½ cup	5.2-9.6	21%-38%
Bran cereal (100%), ⅓ cup	9.1	36%
Artichoke hearts, cooked, ½ cup	7.2	29%
Pear, 1 medium	5.5	22%
Vegetables, cooked, broccoli, soybeans, peas, ½ cup	2.8-5.2	10%-21%
Shredded wheat cereal, ½ cup	2.7-3.8	11%-15%
Whole-wheat English muffin, 1 muffin	4.4	18%
Bulgur, cooked, ½ cup	4.1	16%
Blackberries, ½ cup	3.8	15%
Figs, dried, ¼ cup	3.7	15%
Fruit, Apple with skin, banana or orange, 1 medium	3.1-3.6	12%-14%
Greens, spinach, collard or turnip, cooked, ½ cup	2.5-3.5	10%-14%
Almonds, 1 ounce	3.5	14%
Whole wheat spaghetti, cooked, ½ cup	3.1	12%
Potato, baked, with skin, 1 small	3.0	12%
Whole-wheat bread, 1 slice	1.0-2.0	4%-8%
Oatmeal, cooked with water, regular, ½ cup	2.0	8%

*The %Daily Value for fiber is 25 grams.

Box 3.2 Whole Grain Basics

Whole grains contain both starches *and* fiber as well as important vitamins and minerals. A whole grain has all of the fiber and other nutrients found in the *entire* grain kernel. As part of a healthy diet, whole grains can help you reach a healthy weight, improve your digestive system, and lower your risk of heart disease, diabetes, and certain cancers (Jacobs, 1998).



A **refined grain** does not contain fiber or other important nutrients. The milling process removes the bran and the germ, the parts of the grain that have nutrients. Often, food processors "enrich" grains by adding back iron, thiamin, riboflavin and niacin but they usually don't put fiber back in. If you want the fiber and all the vitamins and minerals that were there at the start, choose *whole* grains. Most Americans eat plenty of grain foods but not enough whole grains. Aim to make at least half of the grain foods you eat each day whole grains.

Tips for Choosing Whole Grains at the Grocery Store

- **Look for the word "whole" in the first name of the ingredient list,** like *whole* wheat flour, *whole* grain wheat, *whole* durum wheat flour, white *whole* wheat, *whole* grain corn, etc. Other whole grain ingredient names include: brown rice, buckwheat, bulgur, millet, oatmeal, popcorn, quinoa, and rolled oats.

- **Look for the Whole Grain Stamp.** Some whole grain foods (but not all) choose to put the Whole Grain Stamp on their packages. To display the basic stamp, a serving of the food must provide at least 8 grams of whole grain. Visit the Whole Grains Council website to learn more about the stamp and shopping for whole grains: www.wholegrainscouncil.org.

- **Don't judge a grain by its color.** Many darker breads are not whole wheat. Likewise, some whole wheat breads are light in color.

- **Don't judge a grain by its package.** A package that says "Wheat Bread" may sound like a whole grain food, but chances are it's not. Also, a package that says "made with whole grain" doesn't always say *how much* whole grain is in the food — it could be a little or a lot. Check the ingredients list to see if the first ingredient is a whole grain.

Part 3

Fats

Fats do more than make our ice cream creamier and our buttered toast tastier. Fats play a major role in cholesterol levels and provide the essential fatty acids our bodies can't make. Also, they help us absorb the four fat-soluble vitamins, vitamins A, D, E, and K. Fats are especially important for brain development and growth in infants and toddlers up to age 2. Each gram of fat has *9 calories* that we use for energy.

So if fats are so important why are health experts always talking about eating less fat? Simply put Americans eat too much of the *wrong kinds of fat*. It's important to know about the different types of fat in foods because some are better for you than others.

Large amounts of saturated fats in the diet increase risk for heart disease and type 2 diabetes.

Harmful Fats ("Solid Fats")

The Dietary Guidelines use the term **"solid fats"** to refer to *both* saturated fats and trans fats. The top sources of solid fats in the U.S. diet are grain-based desserts (cookies, cakes, pies, doughnuts, and granola bars), pizza, cheese, sausage, franks, bacon, ribs, and French fries (USDA, 2010b). Americans need to find ways to reduce these foods and replace them with foods containing healthier fats.

- **Saturated Fats –** These are the "bad" fats found in animal fats. Lard, butter, beef, chicken skin, pork, egg yolks, whole milk, cream, and cheese are a few examples. Palm oil, palm kernel oil, and coconut oil are also saturated fats (Risérus, U., Willett, W.C, and Hu, F.B., 2009). Eating large amounts of saturated fats raises the risk for cardiovascular disease and type 2 diabetes. Americans should limit saturated fat to 10 percent of daily calories. Cutting back to 7 percent can lower the risk of heart disease even more (USDA, 2010a).
- **Trans fat –** Trans fats occur naturally in certain foods. Food manufacturers can also make trans fat through a process called **hydrogenation**. Hydrogenation chemically changes liquid oil into solid fat. Shortening and margarine are both examples of hydrogenated fats (U.S. Food and Drug Administration [FDA], 2011b).

  Trans fat enhances flavor and extends the shelf life of foods, but eating trans fat greatly raises your risk of heart disease.

Specifically, it raises total cholesterol and LDL cholesterol, while lowering the good HDL-cholesterol (CDC, 2010d). The goal is to keep your intake of trans fat as low as possible.

In 2006, FDA required food makers to list trans fat on the Nutrition Facts Label. The food industry has cut back but many processed foods still contain at least small amounts of trans fats. Amounts ≤ 0.5 grams per serving do not have to appear on the Nutrition Facts Label, so label reading can be tricky. Even if the food does not appear to have any trans fats, small amounts eaten in several servings can add up. Savvy consumers should read the ingredients list and look for things like "shortening" or "partially-hydrogenated vegetable oil," as these are indicators that the food contains trans fat. Trans fats are also in some margarines, snack foods, and prepared desserts (FDA, 2003).

Healthier Fats ("Oils")

In contrast to solid fats, **oils** offer a number of nutritional benefits. By replacing harmful solid fats with moderate amounts of healthier oils, Americans can lower their risk for heart disease (Mayo Foundation, 2011a). Studies show that replacing solid fats with oils can also reduce the risk of Type 2 diabetes. Oils are present in vegetables, nuts, seeds, fatty fish, olives, and avocados. There are two main types of unsaturated oils:

- **Monounsaturated fats –** Sources include olive oil, canola oil, peanut oil, sesame oil, avocados, olives, many nuts, nut butters, and seeds. The traditional Mediterranean-style eating pattern is high in monounsaturated fats and people who follow this eating pattern have a lower risk for heart disease (USDA, 2010a).
- **Polyunsaturated fats –** Most polyunsaturated fats are present in plant-based foods and oils. Examples include soybean oil, corn oil, and safflower oil, plus many nuts and seeds. Fatty fish provide a special group of polyunsaturated fats called **omega-3 fats.** Omega-3 fats from seafood appear to lower heart disease risk and in some studies lower blood pressure. Be aware that only certain types of fish provide omega-3 fats. The best sources of omega-3s include salmon, certain types of tuna and mackerel, herring and freshwater trout.

Activity 3.2 — Are You Getting the Right Kinds of Fats?
Refer to your Basic Nutrition Workbook and complete the activity.

Cholesterol

Cholesterol is a waxy fat-like substance found in every cell in the body. It is important for cell structure and the metabolism of fat-soluble vitamins. Cholesterol is found in all foods of animal origin, but you can't see it or taste it. Plant products do not contain cholesterol. Our bodies can make all the cholesterol we need, so we don't need to consume any. But many Americans regularly eat cholesterol daily — from foods like eggs, chicken, beef and burgers. Women eat an average of 240 milligrams (mg) of cholesterol per day, while men get an average of 350 mg per day (USDA, 2010a).

Dietary cholesterol can raise **blood cholesterol** levels in some people. But over the years, researchers have learned that saturated and trans fats are much bigger culprits when it comes to raising blood cholesterol and increasing risk for heart disease. The 2010 Dietary Guidelines say to eat less that 300 mg per day of dietary cholesterol. Table 3.2 lists the cholesterol content of various foods:

Table 3.2 Approximate Cholesterol Content of Various Foods (USDA, 2010c)

Food	Cholesterol (mg)
Liver (3 ounce cooked)	337 mg
Egg (1 yolk)	184 mg
Ground Beef (3 ounce cooked)	76 mg
Chicken (3 ounce cooked)	72 mg
Cheddar Cheese (1 ounce)	30 mg
Whole Milk (1 cup)	24 mg
Bacon (2 slices)	18 mg
Lard (1 tablespoon)	12 mg
Skim Milk	5 mg

Dietary Recommendations for Fats

The Institute of Medicine recommends that adults get 20-35 percent of their calories from fat, and most fat should be in the form of unsaturated oils (USDA, 2010a). Americans should limit their intake of saturated fat to less than 10 percent of calories. For example, this would be about 20 grams of saturated fat for a person following an 1,800-calorie diet. Reducing saturated fat to less than 7 percent of calories would be even better.

Here are some tips:

- Cut back on high-fat desserts like pastries, doughnuts, croissants, pies, cookies, and cake. Find ways to enjoy small servings of these items from time to time rather than eating them often.
- Use lean meats and skim or low-fat dairy products.
- Eat more seafood. The Dietary Guidelines recommend eating 8 to 12 ounces of various types of seafood each week.
- Bake, broil, steam and grill more often rather than frying. Use vegetables oils and olive oil for cooking instead of butter, shortening, or lard.
- Read nutrition labels and ingredient lists to check types and amounts of fat.
- Eat plenty of foods naturally low in fat and high in fiber, such as fruits, vegetables, and whole grains.
- Go easy on the cream cheese, and cream-based sauces and dressings. Look for substitutes. For example, low-fat yogurt, which is also a good source of calcium, can work as a substitute for sour cream.
- Enjoy small servings of cheese. Use grated cheese to help stretch small amounts.

Part 3

Proteins

As a child, you probably learned that protein would help you "grow up to be big and strong." And that's not too far off. Our bodies break down and rebuild tissue all the time, so we need a steady supply of protein to build new tissue. Protein is especially important during periods of rapid growth, like during childhood and pregnancy.

Protein is in many of the foods we eat each day including meats, poultry, and fish, dry beans and peas, tofu, eggs, nuts, seeds, milk and milk products, and breads and cereals. Specialty high-protein products have been a recent fad, suggesting that we need dietary shakes or protein bars to stay strong and healthy. But the fact is, most of us get more than enough protein from food sources on a daily basis.

Amino acids are the building blocks of protein. They combine in different ways to create thousands of proteins. Our bodies can make most of these amino acids, but there are nine **essential amino acids** that we can't make. They are named as such because it's *essential* that we get them from our food supply. Animal products, like meat, milk, and milk products, have all the essential amino acids in the amounts that our bodies need, so they're known as **complete proteins**. Most plant foods don't have enough of all essential amino acids, so scientists classify them as **incomplete proteins.**

Food Sources of Protein

Lean and low-fat or fat-free sources of protein are the best choices (CDC, 2010c). Foods like fish, poultry (white meat), lean beef and pork, fat-free dairy products, dried beans and peas top the list. Nuts and nut butters are also great protein choices, but keep in mind they have many calories packed into each serving. Table 3.3 shows the approximate amount of protein in different types of foods.

Table 3.3 Approximate Protein Content of Various Foods

Food	Grams of Protein
3 ounces meat, fish, poultry	21 grams
3 ounces tofu, firm	13 grams
8 ounces low-fat yogurt	11 grams
8 ounces milk	8 grams
½ cup cooked beans	8 grams
2 tablespoon peanut butter	8 grams
1 ounce cheese	7 grams
¼ cup nuts	7 grams
1 large egg	6 grams
½ cup cereal	3 grams
1 slice bread	2 grams
½ cup grains/pasta, cooked	2 grams
½ cup non-starchy vegetables, cooked	2 grams
Fruits	0 grams
Oils	0 grams

(Adapted from Wheeler et al, 2008)

A 3½ ounce boneless chicken breast has about 30 grams of protein; more than half of the protein most adults need in a day (UDSA, 2010c).

Meeting Protein Needs

For healthy adults, the Recommended Dietary Allowance for protein is **46 grams for women** and **56 grams for men**. Because protein is widely available in many foods most Americans meet their protein requirements without any problem.

Activity 3.3 — How much protein did you eat yesterday?
Refer to your Basic Nutrition Workbook and complete the activity.

Box 3.3 FAQs About Protein

Q: Can I get all the protein I need by eating only plant foods?

A: Yes! It's easy to include different plant proteins in your diet so that you get all the amino acids you need. And these days, there are more vegetarian choices than ever – including soybeans, soymilk, tofu, veggie burgers, amaranth, and quinoa – just to name a few. Be sure to include plenty of whole grains, dried beans and peas, and vegetables.

Q: What happens if I eat too much protein?

A: Most people eat more protein than they need without harmful effects. But some experts warn that eating too much protein over a long period of time can strain the kidneys. That's why people with certain kidney diseases often follow a low-protein diet. Also, be aware that protein-rich foods like cheeses, whole eggs, and high-fat cuts of meat can add a lot of saturated fat to your diet, which can raise your risk for heart disease.

Q: What about all the new food products with added protein?

A: Many special high-protein foods are processed items aimed at dieters who have hopped on the high-protein bandwagon. Many of these items are pricey formulated bars and shakes that can contain extra sodium, added sugars, and unwanted solid fats. Healthier, tastier, and less expensive options would include natural sources of protein like nuts, peanut butter, lean meats, and low-fat dairy products. And again, remember that most people can easily meet their daily protein needs without special foods or supplements.

Dietary Recommendations for Proteins

Rather than focusing on protein intake, choose an overall healthy diet with reasonable portions of lean protein as well as other nutrients. Here are some specific tips:

- Don't go overboard on meat and poultry. Include more meatless meals.
- When you do eat meat, think of it as a flavoring or ingredient. Stretch smaller portions by cutting up meats and using them in mixed dishes and with whole grains. Choose leaner meats and poultry and trim away skin and visible fat.
- Eat more dried beans and peas — beans, chickpeas, lentils and soybeans are great sources of protein. What's more, they're practically fat-free and loaded with fiber and other great nutrients.
- Enjoy a ¼ cup serving of nuts as a snack or use nuts as an ingredient in salads and other dishes. Nuts are great sources of protein, plus they contain healthy oils.
- Choose low-fat or fat-free dairy products.
- Be adventurous with sources of high-quality plant protein like soybeans, quinoa and amaranth. These foods are making their way into restaurants and grocery stores, so give them a try.
- Check with your health care provider if you're thinking about following a high-protein diet for any reason.

Part 3 Test: This is the end of Part 3. Go to your Basic Nutrition Workbook to complete Part 3 test questions.

Vitamins, Minerals, and Water

Part 4

Our bodies need at least 13 vitamins, 16 minerals, and plenty of water to function properly. This part of the module covers vitamin A, vitamin C, vitamin D, folate, calcium, iron, sodium, potassium, and water.

Objectives

After reading this section you'll be able to:

- Recognize the major functions of vitamins, minerals and water.
- Exhibit knowledge about vitamin and mineral basics: identify daily requirements, good food sources, and signs and symptoms of deficiency.
- Recognize groups at increased risk for vitamin or mineral imbalances.
- Understand water needs and signs of dehydration and overhydration.

Part 4

Vitamin and Mineral Basics

- **Key vitamins and minerals prevent specific deficiency diseases.** For example, vitamin D prevents rickets, and iron protects you from anemia.
- **Vitamins and minerals promote long-term health.** Vitamins and minerals are involved in many chemical reactions and body processes. Researchers are always learning more about how different vitamins and minerals help us stay healthy.
- **Vitamins and minerals do not provide calories (or energy).** Instead, they help our bodies *use* the energy we get from carbohydrates, fats and proteins. It's much like oil in a car: a car relies on gasoline for energy, but it needs oil to run and stay in working order. Your body relies on *calories* for energy but it needs *vitamins* and *minerals* to run and stay in good shape.
- **You get different vitamins and minerals when you eat different foods,** which is why it's so important to eat a *variety* of healthy foods.
- **Most Americans don't get enough of the vitamins and minerals they need.** That's not surprising when you look at the typical American diet. Certain groups like pregnant women and the elderly have special nutrient needs that are harder to meet through diet alone.
- **Units of measure differ among vitamins and minerals.** We measure most vitamins and minerals in either *milligrams* (mg) or *micrograms* (mcg). Scientists also use other units of measure. For example, some tables list vitamin A recommendations in micrograms while others list vitamin A in International Units (IU). It can be confusing, but don't worry. Just remember to use the same unit of measure when comparing data for a certain nutrient.
- **The % Daily Value shows how a serving of a food contributes to your daily nutrient needs.** The Nutrition Facts Label on packaged foods lists % Daily Value for certain nutrients. It's an easy way to see if a food is high in or low in nutrients. For example, the label on a carton of nonfat milk shows that an 8-ounce serving provides 30% of the Daily Value for calcium. That's almost one-third of the daily requirement for calcium.

Vitamin A

We need **vitamin A** to resist infection and to keep our eyes, skin, and internal organs healthy. Studies have shown that diets high in vitamin-A rich fruits and vegetables may be linked to a lower rate of certain cancers (National Institutes of Health Office of Dietary Supplements, [NIH ODS], 2006).

Vitamin A Deficiency — A severe vitamin A deficiency can cause blindness, poor growth, problems fighting infections, poor tooth formation, and dry, scaly skin. Serious deficiencies are rare in the U.S., but some people's diets are low enough in vitamin A that they may have less serious symptoms, like slow bone development, slow growth, poor night vision, and a higher risk of infections. Groups who might not get enough vitamin A include children who are at or below poverty level and people who don't eat vegetables (NIH ODS, 2006).

Table 4.1 lists recommended amounts for vitamin A in both International Units (IU) and micrograms of Retinol Activity Equivalents (RAE). Be aware that many food tables list vitamin A content in IUs.

Food Sources of Vitamin A — We get vitamin A from both plant and animal foods. Animal sources include eggs, liver, butter, margarine, fortified milk, and cheese. Plant sources of vitamin A include the yellow pigments of plants like carrots, sweet potatoes, pumpkins, cantaloupes, tomatoes, red peppers, apricots, mango, papaya, as well as dark green vegetables like spinach and kale.

Dangers of too Much Vitamin A from Supplements — High doses of vitamin A from supplements can be toxic, leading to serious birth defects, liver damage, reduced bone strength, and central nervous system disorders. But don't worry about getting too much vitamin A from fruits and vegetables. Large amounts of this form of vitamin A can turn the skin yellow, but it's not dangerous (NIH ODS, 2006).

Good Tips for including Vitamin A

- Include more fresh fruits and vegetables as routine snacks.
- Set a goal to eat at least one vitamin A-rich fruit or vegetable every day.

- Make your meals colorful. Include dark green and orange vegetables and fruits.
- Rely on foods not supplements for vitamin A.

Table 4.1 Daily Vitamin A Recommendations (NIH ODS, 2006)

Age Group	Daily Vitamin A Recommendation
1-3 years	300 mcg* (1000 IU**)
4-8 years	400 mcg (1320 IU)
9-13 years	600 mcg (2000 IU)
14 years and older, Males	900 mcg (3000 IU)
14 years and older, Females	700 mcg (2310 IU)
Pregnant, 14 to 18 years	750 mcg (2500 IU)
Pregnant, 19 years and older	770 mcg (2565 IU)
Breastfeeding, 14 to 18 years	1200 mcg (4000 IU)
Breastfeeding, 19 years and older	1300 mcg (4300 IU)

* micrograms of Retinol Activity Equivalents (RAE)
** International Units (1 mcg RAE = 3.3 IU)

Table 4.2 Approximate Vitamin A Content of Various Foods (USDA, 2010c)

Food	Vitamin A (IU)*	% Daily Value**
Sweet potato cooked, 1 medium (5” long)	21,900	440%
Carrots, boiled, ½ cup sliced	13,286	265%
Spinach or Kale, frozen, boiled, ½ cup	9,500	190%
Vegetable soup, canned, 1 cup	5,820	115%
Cantaloupe, 1 cup cubes	5,411	110%
Apricots with skin, juice pack, ½ cup	2,063	40%
Papaya, 1 cup cubed	1,532	30%
Mango, 1 cup sliced	1,262	25%
Milk, fortified skim, 1 cup	500	10%

* U = International Units
** DV = Daily Value. The DV for vitamin A is 5,000 IU for healthy adults.

Vitamin D

Vitamin D helps build strong bones and teeth and plays an important role in preventing bone diseases like **rickets** (NIH, ODS, 2011b). Rickets occurs in children who have a very low vitamin D intake. The disease causes soft, weak bones, which can lead to short stature, bowed legs, and other skeletal deformities. Vitamin D is also important for bones in adulthood, as it works in conjunction with calcium to prevent **osteoporosis**. We will discuss osteoporosis in more detail in the calcium section.

In addition to bone health, vitamin D is important for the nervous system, muscles, and immune system. There's a lot of interest in vitamin D and its possible role in reducing risk for heart disease, diabetes, and certain cancers. It will be some time before we know the results of current research, but for now, be aware that adequate vitamin D is key for good health (NIH ODS, 2011b).

Vitamin D Status in Americans — Vitamin D is currently a hot topic not only because of the vitamin's possible benefits but also because many Americans apparently have low blood levels of vitamin D. The most recent national data from 2001 to 2006 shows that about one-third of Americans have vitamin D levels that are either low or very low (Looker et al., 2011). This is probably due in part, to less sun exposure (Ginde, Liu, & Camargo, 2009).

The "Sunshine Vitamin" — The skin makes vitamin D when it's exposed to the sun, and sunlight has been a major source of vitamin D production for humans until recent years. These days, many people wisely use sunscreen or cover up when they go outside, so they're getting less vitamin D from the sun. Also, people living in areas of heavy pollution tend to get less sunshine and older adults and people with darker skin naturally make less vitamin D (NIH ODS, 2011b). Since fewer people rely on sunshine for vitamin D, there is a greater focus on vitamin D supplements and food sources.

Food Sources of Vitamin D — Be aware that vitamin D is not naturally present in many foods. The few good sources include fatty fish like salmon, tuna, and mackerel. There are smaller amounts in liver, cheese, butter, and egg yolks. Many foods are fortified with vitamin D including many brands of milk, yogurt, breakfast cereals, orange juice, margarine, and soy beverages. Some brands of mushrooms treated with ultraviolet light provide a full day's worth of vitamin D (NIH ODS, 2011b).

Table 4.3 Daily Vitamin D Recommendations (NIH ODS, 2011b)

Age Group	Daily Vitamin D Recommendation
Birth to 12 months	10 mcg (400 IU)*
1-13 years	15 mcg (600 IU)
14-18 years	15 mcg (600 IU)
19-70 years	15 mcg (600 IU)
71 years and older	20 mcg (800 IU)
Pregnant and breastfeeding women	20 mcg (800 IU)

* International Units

Table 4.4 Approximate Vitamin D Content of Various Foods (USDA, 2010c)

Food	Vitamin D (IU)*	% Daily Value**
Salmon (Sockeye), cooked, 3 ounces	447	112%
Mushrooms exposed to ultraviolet light (check labels)	400	100%
Mackerel, cooked, 3 ounces	388	97%
Tuna fish, canned in water, drained, 3 ounces	154	39%
Milk, nonfat, reduced fat, or whole, vitamin D-fortified, 1 cup	120	30%
Orange juice fortified with vitamin D, 1 cup (check labels)	100	25%
Yogurt, fortified with vitamin D, 6 ounces (some may have more)	80	20%
Margarine, fortified, 1 tablespoon	60	15%
Ready-to-eat cereal, fortified with vitamin D, ¾ -1 cup (check labels)	40	10%
Egg, 1 whole (vitamin D is found in yolk)	41	10%

* mg = milligrams
** DV = Daily Value. The DV for vitamin D is 400 IU for healthy adults.

Vitamin C

Vitamin C (ascorbic acid) helps the body fight off infections, heals wounds, and plays an important role in growth and repair of tissues. Vitamin C also enhances iron absorption, so it's a good idea to combine iron-rich foods with foods high in vitamin C. Vitamin C is one of the common **antioxidants** in our diet. Antioxidants are substances that may protect the body's cells against oxidative damage and possibly help lower the risk of heart disease, cancer, and other diseases (National Center for Complementary and Alternative Medicine, 2011).

Vitamin C Deficiency — A severe vitamin C deficiency can lead to scurvy, a disease that once plagued sailors who were on long voyages without vitamin C-rich fresh fruits or vegetables. Symptoms included slow wound healing, easy bruising, swollen and painful joints, dry and scaly skin and bleeding gums. Scurvy is rare in the U.S. today, but many groups are at risk for not meeting their daily needs for vitamin C, including smokers, alcoholics, and those with low fruit and vegetable intake (NIH ODS, 2010).

Food Sources of Vitamin C — Fruits and vegetables are the best sources of vitamin C, especially red and green peppers, citrus fruits and juices, broccoli, kiwi, Brussels sprouts, tomatoes, and tomato juice. Heat, light, and air can destroy vitamin C, so the vitamin content depends on if your food is raw, steamed, boiled, freshly harvested or previously stored.

Vitamin C and the Common Cold — You may have heard claims that taking supplemental vitamin C can prevent or cure the common cold. Research suggests that taking vitamin C on a regular basis does not *prevent* the common cold in the general population, but taking it before the onset of a cold *might* shorten the duration and lessen the symptoms in some people. On the other hand, taking extra vitamin C *after* the onset of cold symptoms does not seem to help (NIH, ODS, 2010). So the next time you're sniffling and sneezing, you may want to think twice before spending your money on vitamin C supplements.

Vitamin C Tips — Try eating at least one vitamin C-rich food every day. Since storage and cooking reduce vitamin C levels, follow these tips to get the most vitamin C from your foods:

- Choose produce that looks fresh, not wilted or sunken in.
- Buy produce in season or grow your own at home.
- Include raw fruits and vegetables in your meals.
- Avoid soaking vegetables in water. Steam vegetables and cook them quickly.
- Cook potatoes in their skins.
- Cover and refrigerate juice.

Table 4.5 Daily Vitamin C Recommendations (NIH ODS, 2010)

Age Group	Daily Vitamin C Recommendation
Birth to 6 months	40 mg*
7-12 months	50 mg
1-3 years	15 mg
4-8 years	25 mg
9-13 years	45 mg
14-18 years	Females: 65 mg Males: 75 mg
19 years and older	Females: 75 mg Males: 90 mg
Pregnancy: 14-18 years	80 mg
Pregnancy: 19 years and older	85 mg
Breastfeeding: 14-18 years	115 mg
Breastfeeding: 19 years and older	120 mg
Smokers	Smokers need an additional 35 mg/day more vitamin C than non-smokers

* mg = milligrams

Table 4.6 Approximate Vitamin C Content of Various Foods (USDA, 2010c)

Food	Vitamin C (mg)*	% Daily Value**
Red pepper, raw, ½ cup	95	158%
Orange juice, ¾ cup	93	155%
Kiwifruit 1 medium	71	118%
Orange, 1 medium	70	117%
Grapefruit juice, ¾ cup	70	117%
Green pepper, raw, ½ cup	60	100%
Strawberries, fresh, ½ cup	49	82%
Brussles sprouts, cooked, ½ cup	48	80%
Broccoli, raw, ½ cup	39	65%
Tomato juice, ¾ cup	33	55%
Cantaloupe, ½ cup	29	48%
Cabbage, cooked, ½ cup	28	47%
Potato, baked, 1 medium	20	33%

* mg = milligrams
** DV = Daily Value. The DV for vitamin C is 60 mg for healthy adults.

Folate (and Folic Acid)

The body uses **folate** to create new cells, so this is an important nutrient during times of rapid growth, like pregnancy and infancy (NIH ODS, 2009). Folate gets its name from the Latin word *folium*, meaning leaf. Not surprisingly, green leafy vegetables are good sources of folate. **Folic acid** is the synthetic form used in supplements and foods like cereals, breads and grain products.

WIC puts a great deal of effort into teaching women about folic acid because this vitamin reduces the risk of neural tube defects, a group of serious birth defects. The benefits of folic acid became clear in the mid-1990s when food companies began adding folic acid to breads, cereals, and other grain products. As a result, the prevalence of neural tube defects dropped by 36% (Cordero et al., 2010).

The key is to get enough folic acid during the first 30 days of pregnancy, a time when many women don't even know they are pregnant. That's why experts recommend that women who could become pregnant get 400 mcg of folic acid per day from fortified foods and/or dietary supplements, in addition to eating foods rich in folate (NIH, ODS, 2009). For more information on this topic, refer to Texas WIC's *Women's Health Module*.

Best Sources of Folate and Folic Acid — Leafy green vegetables, like spinach and turnip greens, dried beans, peas, citrus fruits, and juice are all natural sources of folate. The best sources of folic acid are fortified breakfast cereals and grains.

Table 4.7 Daily Folate Recommendation (NIH ODS, 2009)

Age Group	Daily Folate Recommendation
1-3 years	150 mcg*
4-8 years	200 mcg
9-13 years	300 mcg
14-18 years	400 mcg
19 years and older	400 mcg
Pregnancy: 14 years and older	600 mcg
Breastfeeding: 14 years and older	500 mcg

* listed in micrograms of Dietary Folate Equivalents (DFE), 1 DFE = 1 mcg food folate = 0.6 mcg folic acid from supplements and fortified foods.

Table 4.8 Approximate Folate and Folic Acid Content of Various Foods (USDA, 2010c)

Food	Folate or Folic Acid (mcg)*	% Daily Value**
Breakfast cereals, fortified with 100% of the DV, ¾ cup***	400	100%
Black-eyed peas, cooked, boiled, ½ cup	105	25%
Spinach, frozen, cooked, boiled, ½ cup	100	25%
Great Northern beans, boiled, ½ cup	90	20%
Asparagus, boiled, 4 spears	85	20%
Rice, white, parboiled, enriched, cooked, ½ cup***	65	15%
Spinach, raw, 1 cup	60	15%
Broccoli, raw, 2 spears (each 5 inches long)	45	10%
Avocado, raw, all varieties, sliced, ½ cup	45	10%
Lettuce, Romaine, shredded, ½ cup	40	10%
Orange juice, 6 ounces	35	10%

* listed in micrograms of Dietary Folate Equivalents (DFE), 1 DFE = 1 mcg food folate = 0.6 mcg folic acid from supplements and fortified foods

** DV = Daily Value. The DV for folate is 400 micrograms for healthy adults.

*** These items are fortified with folic acid.

Part 4

Calcium

Calcium is important for bone health. Your bones are in a continuous state of change — they constantly take up calcium and release it back into the blood. As your body uses up calcium, you need to replace it by eating more calcium-rich foods. If you *don't* eat enough calcium, bones can become porous and fragile. But there's more to calcium than just keeping bones strong. Calcium is also important for blood clotting, stimulating nerves, keeping your blood pressure normal, helping muscles contract, and maintaining your heartbeat (NIH ODS, 2011a).

Building and keeping strong bones throughout life — The body forms most of its bone mass during the childhood and teenage years, so children and teenagers need plenty of calcium. After age 20, the bones quit growing, but most people continue to form bone mass until about age 30. At that point, the bones start to *lose* more calcium than they gain, a process which slowly weakens the skeleton. Fortunately, most people can prevent this bone loss by getting enough calcium, vitamin D, and exercise, and by avoiding tobacco and excessive alcohol (NIH Osteoporosis and Related Bone Diseases National Resource Center, 2009).

In later adulthood, **osteoporosis** can develop if there's a long history of poor calcium intake and/or other risk factors. A person with osteoporosis has porous and brittle bones, and a high risk of breaking bones. Patients can develop a humped back as the bones of the spine shrink. The risk of osteoporosis increases with:

- Being a woman
- Early menopause
- A family history of osteoporosis
- Being Caucasian or Asian race
- Being underweight
- Smoking cigarettes
- Alcohol abuse
- A sedentary lifestyle
- A very low intake of dietary calcium

Food Sources of Calcium — Dairy products are the main source of calcium, especially yogurt and milk. An 8-ounce serving of milk provides about one-third of daily calcium needs. Milk also has protein, vitamin D, and phosphorous, all of which help the body use calcium.

Non-dairy sources of calcium include fish with edible bones, soymilk, tofu, and fortified foods like calcium-fortified orange juice, pasta, and certain cereals. Chinese cabbage, kale, broccoli, and almonds have smaller amounts. Calcium content varies among different brands of tofu, yogurt, and other items, so read the labels. Lastly, be aware that caffeine may interfere with calcium absorption.

Table 4.9 Daily Calcium Recommendations (NIH ODS, 2011a)

Age Group	Daily Calcium Recommendation
Birth to 6 months	200 mg*
7-12 months	260 mg
1-3 years	700 mg
4-8 years	1000 mg
9-13 years	1300 mg
14-18 years	1300 mg
19-50 years	1000 mg
51-70 years	Females: 1200 mg, Males: 1000 mg
Pregnancy: 14-18 years	1300 mg
Pregnancy: 19 years and older	1000 mg
Breastfeeding: 14-18 years	1300 mg
Breastfeeding: 19 years and older	1000 mg

* mg = milligrams

Table 4.10 Approximate Calcium Content of Various Foods (USDA, 2010c)

Food	Calcium (mg)*	% Daily Value**
Ready-to-eat cereal, calcium-fortified, 1 cup	100-1000	10-100%
Tofu, regular, prepared with calcium sulfate, ½ cup	434***	43%
Orange juice, calcium fortified, 6 ounces	375	38%
Yogurt, low-fat or non-fat, 8 ounces	245-384	25-38%
Sardines, with edible bones, canned in oil, 3 ounces	306	31%
Cheese, cheddar or part-skim mozzarella, 1.5 ounces	275-306	28-31%
Milk, 8 ounces	300	30%
Pink salmon, canned, solids with bone, 3 ounces	181	18%
Spinach, cooked, ½ cup	120	12%
Kale, cooked, 1 cup	94	9%
Almonds, 1 ounce	75	8%
Pinto beans, boiled, ½ cup	39	4%
Broccoli, raw, ½ cup	21	2%

* mg = milligrams
** DV = Daily Value. The DV for calcium is 1000 mg for healthy adults.
*** Calcium content is for tofu processed with a calcium salt. Tofu processed with other salts does not provide significant amounts of calcium

Iron

Our bodies need **iron** for cell growth, enzymes, and many other reactions. Iron's main job is to help form hemoglobin, the protein in red blood cells that carries oxygen to the tissues. If your body doesn't have enough iron, your red blood cells can't carry as much oxygen, which can leave you feeling tired and weak. On the other hand, too much iron in the form of supplements can be toxic for some individuals (NIH ODS, 2007). One example is accidental iron poisoning in young children who consume large doses of iron supplements.

Iron deficiency is the number one nutritional disorder in the world, according to the World Health Organization. Researchers estimate that up to 80% of the world's population may have *iron deficiency*, and 30% may have *iron-deficiency anemia*, the more advanced stage of iron deficiency (NIH ODS, 2007). Usually the problem is related to poor dietary intake, but it can also result from poor absorption, rapid growth, and/or major blood loss.

Iron-deficiency anemia starts out as iron deficiency and then progresses to a more advanced stage. At first, you develop a negative iron balance, which means the body is not getting enough or absorbing enough iron. Once you have a negative iron balance your body starts using its iron stores. At first, your blood hemoglobin level — a marker of iron status — stays normal. But once your iron stores are used up, your blood hemoglobin levels drop below normal and you start showing physical signs of iron-deficiency anemia.

A person with iron-deficiency anemia may have enough energy for most activities of daily living, but physical effort can be very difficult. Running, climbing stairs, or even rapid walking is hard because the muscle cells do not have the oxygen they need to produce energy. Other symptoms include:

- ☐ Decreased work and school performance.
- ☐ Higher chance of infection.
- ☐ Glossitis (inflamed tongue).
- ☐ Slow cognitive development in childhood.
- ☐ Shorter attention span.

☐ Problems breathing, especially during exercise.

☐ Decreased ability to regulate body temperature.

Food Sources of Iron — Iron is present in many foods. Our bodies don't absorb all the iron we eat, so it can be a challenge to get enough from only foods. Iron from animal products is better absorbed than iron from plant foods, but all sources of iron are important. The best sources include red meat, oysters and clams, poultry, fortified cereals, and dried beans and peas.

Iron Absorption — The foods you eat can affect the amount of iron your body absorbs. For example, eating vitamin C-rich foods along with foods containing iron helps your body absorb more of the iron. On the other hand, tea, coffee, spinach, chocolate, soy protein, wheat bran, calcium supplements, and fiber all interfere with iron absorption. To get the most iron from your foods, here are some tips:

- Include vitamin C-rich foods in your meals. For example, serve green and red peppers along with chicken or beef, or orange juice along with iron-fortified cereal.
- Avoid drinking tea and coffee with meals, including decaffeinated coffee and tea (it's not the caffeine that decreases iron absorption, but substances called polyphenols).
- Cook foods in iron pots. When acidic foods such as spaghetti sauce or chili are cooked in iron pots, the food absorbs some of the iron from the pot.
- Include meat in your diet. The iron in meat is well absorbed and it helps the body absorb iron from plant sources.

Table 4.11 Daily Iron Recommendations (NIH ODS, 2007)

Age Group	Daily Iron Recommendation
7-12 months	11 mg*
1-3 years	7 mg
4-8 years	10 mg
9-13 years	8 mg
14-18 years, Males	11 mg
14-18 years, Females	15 mg
19-50 years, Males	8 mg
19-50 years, Females	18 mg
51 years and older	8 mg
Pregnancy: 14 years and older	27 mg
Breastfeeding: 14-18 years	10 mg
Breastfeeding: 19 years and older	9 mg

* mg = milligrams

Table 4.12 Approximate Iron Content of Various Foods (USDA, 2010c)

Food	Iron (mg)*	% Daily Value**
Ready-to-eat cereal, 100% iron fortified, ¾ cup	18.0	100%
Chicken liver, cooked, 3½ ounces	12.8	71%
Oatmeal, instant, fortified, made with water, 1 cup	10.0	56%
Soybeans, mature, boiled, 1 cup	8.8	49%
Lentils, boiled, 1 cup	6.6	37%
Beans (lima or navy), mature, boiled, 1 cup	4.5	25%
Beans (black or pinto), mature, boiled, 1 cup	3.6	20%
Molasses, blackstrap, 1 tablespoon	3.5	19%
Tofu, raw, firm, ½ cup	3.4	19%
Spinach, boiled, drained, ½ cup	3.2	18%
Beef, chuck, lean only, braised, 3 ounces	3.2	18%
Beef, tenderloin, roassted, 3 ounces	3.0	17%
Turkey, dark meat, roasted, 3½ ounces	2.3	13%

* mg = milligrams
** DV = Daily Value. The DV for iron is 18 mg for healthy adults.

Sodium

Sodium plays an important role in nerve function, muscle contraction and fluid balance in the body. But the average American gets too much sodium — about **3,400 mg** a day. Too much sodium can lead to high blood pressure and increase your risk for *heart disease* and *stroke*, two of the top three causes of death in U.S. adults (Appel et al., 2011). Studies show that the more salt a person eats, the higher his or her blood pressure. Other factors, such as genetics or salt sensitivity, can also contribute to high blood pressure.

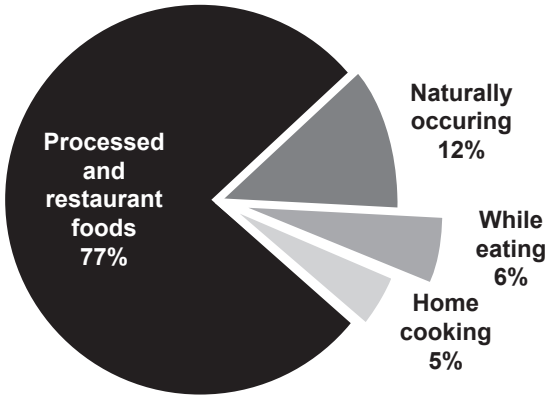
Some people with normal blood pressure may feel like they don't need to think about how much sodium they eat, but consider this: about one in three adults has high blood pressure. Also, blood pressure increases with age in all people, and about 90% of adults eventually develop high blood pressure (Appel et al., 2011).

The latest guidelines say that Americans should get no more than **2,300 mg** of sodium a day, which is equal to about 1 teaspoon of table salt. Certain populations have even lower recommendations (HHS, n.d.). The following groups should take in no more than **1,500 mg** of sodium a day (about 2/3 teaspoon of table salt):

- people 51 years of age or older
- African Americans
- people with high blood pressure, diabetes, or chronic kidney disease

These three groups account for about half the U.S. population and the majority of adults.

Figure 4.1 Most Sodium Comes from Processed and Restaurant Food



High-Sodium Foods — Only 5 to 10% of our sodium intake comes from adding salt while cooking and eating. Most of the sodium we eat (about 75%) comes from processed foods, fast foods, and restaurant foods. A small amount of sodium is naturally present in foods. Figure 4.1 shows where most of our sodium comes from (Mattes and Donnelly, 1991).

Some of the highest sodium foods include soups, pizza, frozen meals with sauces, boxed stuffing, instant rice or pasta mixes, processed lunchmeats, and cheeses. If it's a convenience food, chances are it is high in sodium. The good news is that the food industry is getting the message. A number of food companies are reformulating their products to lower the sodium. It's also up to you to make a few changes. Follow these tips to cut back on sodium:

- Eat *more* fresh foods and *fewer* processed foods. Cook more foods at home from scratch.
- Season your foods with spices, herbs, or lemon juice rather than table salt or seasoned salt blends.
- Choose fresh, frozen, or low-sodium canned vegetables rather than canned. If you do choose canned vegetables, rinse them prior to cooking to remove extra sodium.
- Choose fresh or frozen meat, poultry, and seafood rather than breaded, canned, cured, smoked products, or processed lunchmeats.
- Look for labels that say "low-sodium." They contain 140 mg or less of sodium per serving.

Adjusting to a Lower Sodium Diet — We tend to like salty flavors, so it might be hard to eat lower-sodium foods at first. Remember that changes take time. Cut back slowly, and over time, your taste for salt will lessen and your taste buds will learn to appreciate the other flavors in foods (Mayo Foundation, 2011b).

Activity 4.1 — How much sodium is in your foods?
Refer to your Basic Nutrition Workbook and complete the activity.

Table 4.13 Approximate Sodium Content of Various Foods
(Adapted from Center for Science in the Public Interest, 2008 and USDA, 2010c)

Food	Sodium (mg)*	% Daily Value**
Soy sauce, 1 tablespoon	920-1160	38-48%
Tomato soup, reconstituted, 8 ounces	700-1260	29-53%
Tomato juice, 8 ounces	340-1040	14-43%
Instant noodles, 1 serving	875-1170	36-49%
Frozen pizza, cheese, 4 ounces (1 small slice)	450-1200	19-50%
Macaroni & cheese, canned/boxed, 1 cup	520-1027	22-43%
Spaghetti sauce, 4 ounces	330-700	14-29%
Lunch meat, ham or bologna, 1 slice	300-365	13-15%
Pretzels, salted, 1 ounce (~17 small pretzels)	385-560	16-23%
Cottage cheese, ½ cup	370-460	15-20%
Cheese, processed, American, 1 ounce	275	12%
Canned mixed vegetables, ½ cup	250	10%
Barbeque sauce, 2 tablespoons	230-510	10-21%
Salad dressing, regular, 2 tablespoons	110-505	5-21%
Salsa, 2 tablespoons	150-240	6-10%
Instant oatmeal, flavored, 1 packet	180-294	8-12%
Bacon, pork, 1 slice	190-261	8-11%
Breads, all types, 1 slice	95-210	4-9%
Potato chips, 1 ounce (~15 chips)	120-180	5-8%
Tortilla chips, 1 ounce (~10 chips)	105-160	4-7%

* *DV = Daily Value. The DV for sodium is 2400 mg*

Potassium

In the body, **potassium** works with sodium to help contract muscles, transmit nerve impulses, and control heartbeat and blood pressure. Potassium helps to *lower* blood pressure by balancing the bad effects of sodium. What's more, potassium can reduce your risk of kidney stones and decrease your bone loss (HHS, n.d.).

The typical American diet is high in sodium and low in potassium, which is opposite of how it should be. We need to turn this around and find ways to cut back on sodium while boosting potassium intake. The recommended amount of potassium for adults is 4,700 milligrams a day. Most Americans do not get enough (IOM, 2005b).

There are certain people who need to limit their potassium or at least keep it in check. People with kidney disease and those who take certain medicines like ACE inhibitors should talk to their health-care provider about the amount of potassium in their diets.

Food sources of potassium — Potassium is found in all food groups. Rich sources include potatoes, tomatoes, bananas, and orange juice. Table 4.14 lists more good food sources. Check the table to see what foods you might choose to increase your intake of potassium.

Table 4.14 Daily Potassium Recommendations (IOM, 2005b)

Age Group	Daily Potassium Recommendation
0-12 months	400 mg*
1-3 years	3000 mg
4-8 years	3800 mg
9-13 years	4500 mg
14+ years	4700 mg
Pregnancy	4700 mg
Breastfeeding	5100 mg

* mg = milligrams

Table 4.15 Approximate Potassium Content of Various Foods (USDA, 2010c)

Food	Potassium (mg)*	% Daily Value**
Potato, 1 small baked russet or 1 cup mashed	690-760	20-22%
Prune juice, 1 cup	707	20%
Carrot juice, 1 cup	689	17%
White beans, canned, ½ cup	595	17%
Tomato juice, 1 cup	556	16%
Plain yogurt, low-fat or nonfat, 8 ounces	531-579	15-17%
Sweet potato, baked in skin, 1 medium	542	15%
Orange juice, 1 cup	500	14%
Fish, Pacific cod or Rockfish, 3 ounces cooked	440	13%
Milk, all varieties, 1 cup	350-425	10-12%
Banana, 1 medium	422	12%
Spinach, cooked, ½ cup	400	11%
Pork loin, center rib, roasted, 3 ounces	371	11%
Lentils, kidney or pinto beans, cooked, ½ cup	300-370	9-11%

* mg = milligrams
** DV = Daily Value. The DV for potassium is 3500 mg.

Activity 4.2 — What are Your Favorite Sources of Key Vitamins and Minerals?
Refer to your Basic Nutrition Workbook and complete the activity.

Dietary Supplements

Supplements are a hot topic. They are easy to buy, they don't require a prescription, and they claim to have amazing benefits. Whatever ails you, there seems to be some kind of vitamin, mineral, herbal product, enzyme, or other substance that can help.

More than half of U.S. adults take a **dietary supplement** (Bailey et al, 2011). But the reality is that most people can meet their daily requirements from food alone, without dietary supplements. And research shows that there are many benefits to getting your nutrients from whole foods. The bottom line is that supplements shouldn't *replace* a healthy diet, but simply do as the name implies — *supplement*, or enhance, a healthy diet. Here are some other things to remember about supplements:

- **Supplements are not regulated.** The U.S. government does not control or approve supplements for safety and effectiveness. Dietary supplements can contain other substances such as fillers or other ingredients that can be harmful.
- **Labels can be misleading.** Manufacturers often use terms that have no official definition. For example, there's no official definition for "natural," and a product labeled "natural" is not necessarily safe. Many supplements have false claims such as "cure-all," "totally safe," and "no side effects."
- **High doses can be expensive and dangerous.** Both manufacturers and consumers tend to think "more is better" when it comes to supplements. So people often get more than the daily recommended intake of various nutrients. In many cases, the body absorbs what it can and then excretes the rest, which can result in some very expensive urine! In other cases, very high doses of certain nutrients can cause harmful side effects.
- **Foods are fortified.** If you think you aren't getting enough nutrients from your food, think again. Many food companies add vitamins and minerals to certain foods like cereals, bread, flour, grain products, milk, and juices.

For more information on the safe use of supplements, visit the National Institute of Health Office of Dietary Supplements webpage at: http://ods.od.nih.gov/

While most people can get all they need from foods alone, certain populations may need supplements:

- Women of childbearing age
- Pregnant or breastfeeding women
- Elderly
- Smokers
- Alcoholics
- Vegetarians or vegans
- Those with certain diseases or medical conditions (including cancer, digestive tract diseases, metabolic conditions, and eating disorders)
- Recipients of gastric-bypass surgery

If you are unsure about whether you or a participant needs a supplement, talk to a doctor.

Water

Consider this amazing fact: over half of our body is water — that's about 10 to 12 gallons! **Water** lubricates joints and organs; helps regulate our temperature; removes waste products; and makes up major body fluids like blood, saliva, sweat, urine, and amniotic fluid. Obviously, we need water — we can't survive long without it.

Our bodies naturally lose about one to two liters of fluid each day through urine. Things like illness, vomiting or diarrhea, vigorous exercise, or just being in the Texas summer heat can increase water loss. If you don't replace the water that your body loses, you can get *dehydrated*. Symptoms include dry mouth, very little or no urine output, dark yellow urine, sunken eyes, low blood pressure, and headache. In severe dehydration, symptoms progress to delirium and can cause brain damage or death. Infants, children, and the elderly are at higher risk for dehydration. (Medline Plus, 2009)

Sometimes people become *overhydrated*. Overhydration (or water intoxication) happens when a person drinks more water than their body needs. People with heart, kidney or liver disease are at a higher risk of developing overhydration because they may not be able to get rid of water easily. Also, endurance athletes who drink too

much plain water without added electrolytes during an event can overdo it and become overhydrated (Smith & Mechanick, 2008). Symptoms include confusion, nausea, muscle cramps or twitching and weakness. Extreme overhydration may result in paralysis, coma, seizures, or even death.

Meeting water needs. You may have heard that you should drink eight glasses of water a day. This is good general advice, though it's not a magic number that fits everyone. Water needs vary from person to person and throughout different seasons and situations.

The best way to know how much water you need is to listen to your body and drink enough water during the day to avoid feeling thirsty. Also, make sure you urinate regularly. Urine should be colorless or slightly yellow, rather than dark yellow. Dark yellow urine is often an early sign of dehydration. And keep in mind that we get water from the foods we eat. For example, if you eat a large bowl of soup, the water in the soup provides water to your body. Many fruits and vegetables are also high in water, including tomatoes, oranges, lettuce, and watermelon.

Here are some tips to help increase water intake:

- Fill a pitcher or large water bottle with water so you can keep track of how many cups you drink throughout the day. Carry a water bottle with you.
- Drink water with meals and snacks.
- Drink water before, during, and after regular exercise.
- If you participate in endurance events, you may need to drink fluids with sodium and potassium, like sports drinks. Talk with your doctor to learn more.
- Drink water when you are outside or in extreme heat.
- Enjoy foods that are high in water with meals or as snacks.
- Avoid beverages that contain caffeine and alcohol.

What Should You Drink? Plain water is the very best choice. It is readily available, has no calories and is inexpensive. Low-fat milk is also a good choice because it is high in water and has calcium, protein, and other important nutrients. Sweetened drinks contribute to daily water intake, but the added caffeine, sugar, and calories don't

offer the best nutrition for your body. Too much caffeine and alcohol cause your body to lose extra water so drink these sparingly. Your best bet is to reach for water whenever you can. (Popkin et al., 2006).

Figure 4.2 Quick Guide to the Best Beverages for Adults

Poor ➢ ➢ ➢ ➢	Better ➢ ➢ ➢ ➢	Best
Fruit Drinks	Reduced fat/ whole milk	Plain water
Sports/energy drinks	100% Fruit and vegetable juices	Low-fat/skim milk (regular or soy)
Sweetened coffee or tea beverages	Diet soda or diet flavored water	
Regular soda	Small amounts of unsweetened tea or coffee	
Alcohol		

(Adapted from Popkin et al., 2006)

Part 4 Test: This is the end of Part 4. Go to your Basic Nutrition Workbook and complete the Part 4 test questions.


GReeN!

Sound Advice for a Healthier America

Part 5

In this section, we will discuss practical ways to apply the nutrient basics. We'll briefly review the *2010 Dietary Guidelines for Americans, ChooseMyPlate.gov, the 2008 Physical Activity Guidelines,* and other practical strategies that will help you and your WIC clients live a healthier lifestyle.

Objectives

After reading Part 5 you'll be able to:

- Distinguish empty-calorie foods from nutrient-dense foods.
- Identify calories burned in various physical activities.
- Describe the benefits of cooking at home.
- List the four principles of food safety.
- Identify visuals that are equivalent to certain portion sizes.
- State the physical activity guidelines for adults.
- Describe eating practices that are examples of mindful eating.
- Recognize the USDA's MyPlate method of meal planning.

Part 5

The 2010 Dietary Guidelines for Americans

Every 5 years, USDA and the US Department of Health and Human Services (HHS) issue an updated version of the Dietary Guidelines. The guidelines offer sound nutrition advice based on high-quality scientific data and expert reviews.

With two of every three Americans being overweight or obese, the 2010 Dietary Guidelines Committee issued a call to action for individuals, communities, governments and the food industry to combat obesity. The 2010 Dietary Guidelines have two key messages:

- **"Maintain a calorie balance to reach and stay at a healthy weight."** In other words, Americans need to eat less and move more.
- **"Focus on nutrient-dense foods and beverages."** Eat more vegetables, fruits, whole grains, fat-free and low-fat dairy products, fish, and lean meats, and eat fewer snack foods, grain-based desserts, refined grains, and sugary beverages.

The Guidelines also advise Americans to get more of certain healthy nutrients (like potassium, fiber, calcium and vitamin D), and cut back on unhealthy nutrients (like sodium, saturated fats and trans fats). To read the full Dietary Guidelines publication and other related materials go to http://www.cnpp.usda.gov/dietaryguidelines.htm.

USDA's ChooseMyPlate.gov

Figure 5.1

In 2011, USDA replaced the Food Guide Pyramid with an easy-to-understand symbol called MyPlate (see Figure 5.1). The MyPlate icon shows how the five major food groups fit together for a healthy lifestyle. For a healthy meal, fill half of your plate with fruits and vegetables, add a serving of whole grains, choose a healthy source of protein, and add a side of low-fat dairy (USDA 2011).

USDA's accompanying website, www.ChooseMyPlate.gov, serves as a tool that consumers can use to help put the U.S. Dietary Guidelines into practice. ChooseMyPlate.gov focuses on portion control, balance, and increasing healthy nutrients (see figure 5.2).

Figure 5.2 Key Messages from USDA

10 tips
Nutrition Education Series

choose MyPlate

10 tips to a great plate

Making food choices for a healthy lifestyle can be as simple as using these 10 Tips.
Use the ideas in this list to *balance your calories*, to choose foods to *eat more often*, and to cut back on foods to *eat less often*.

1 balance calories

Find out how many calories YOU need for a day as a first step in managing your weight. Go to www.ChooseMyPlate.gov to find your calorie level. Being physically active also helps you balance calories.

2 enjoy your food, but eat less

Take the time to fully enjoy your food as you eat it. Eating too fast or when your attention is elsewhere may lead to eating too many calories. Pay attention to hunger and fullness cues before, during, and after meals. Use them to recognize when to eat and when you've had enough.

3 avoid oversized portions

Use a smaller plate, bowl, and glass. Portion out foods before you eat. When eating out, choose a smaller size option, share a dish, or take home part of your meal.

4 foods to eat more often

Eat more vegetables, fruits, whole grains, and fat-free or 1% milk and dairy products. These foods have the nutrients you need for health—including potassium, calcium, vitamin D, and fiber. Make them the basis for meals and snacks.

5 make half your plate fruits and vegetables

Choose red, orange, and dark-green vegetables like tomatoes, sweet potatoes, and broccoli, along with other vegetables for your meals. Add fruit to meals as part of main or side dishes or as dessert.

6 switch to fat-free or low-fat (1%) milk

They have the same amount of calcium and other essential nutrients as whole milk, but fewer calories and less saturated fat.

7 make half your grains whole grains

To eat more whole grains, substitute a whole-grain product for a refined product—such as eating whole-wheat bread instead of white bread or brown rice instead of white rice.

8 foods to eat less often

Cut back on foods high in solid fats, added sugars, and salt. They include cakes, cookies, ice cream, candies, sweetened drinks, pizza, and fatty meats like ribs, sausages, bacon, and hot dogs. Use these foods as occasional treats, not everyday foods.

9 compare sodium in foods

Use the Nutrition Facts label to choose lower sodium versions of foods like soup, bread, and frozen meals. Select canned foods labeled "low sodium," "reduced sodium," or "no salt added."

10 drink water instead of sugary drinks

Cut calories by drinking water or unsweetened beverages. Soda, energy drinks, and sports drinks are a major source of added sugar, and calories, in American diets.

USDA United States Department of Agriculture
Center for Nutrition Policy and Promotion

Go to www.ChooseMyPlate.gov for more information.

DG TipSheet No. 1
June 2011
USDA is an equal opportunity provider and employer.

You can visit www.ChooseMyPlate.gov to create your own personalized food plan based on age, gender, physical activity status, and weight-loss goals. This website is a great resource for people who want to learn more about eating right, serving sizes, food groups and weight loss, and more. There is also information for children and pregnant and breastfeeding women.

Activity 5.1 — Get a Daily Food Plan at ChooseMyPlate.
Go to your Basic Nutrition Workbook and complete the activity.

The 2008 Physical Activity Guidelines

In 2008, the U.S. Department of Health and Human Services issued its first-ever *Physical Activity Guidelines*. The goal of the Guidelines is to improve the health of Americans 6 years and older through physical activity. To view the guidelines, go to http://www.health.gov/paguidelines/.

Physical activity has huge health benefits. Being active is one of the best tools for losing weight and keeping it off. What's more, physical activity can improve your quality of sleep, boost your bone density, and help you feel better about yourself. Engaging in regular physical activity can also lower your risk of:

- Heart disease
- Stroke
- High blood pressure
- High cholesterol
- Type 2 diabetes
- Colon cancer
- Breast cancer
- Depression

How much activity do people need? The amount of exercise a person needs each week depends on how *intense* the activities are and how much activity they already do. For example, a casual stroll down the street is a "low-intensity" activity, and is a great first step toward being active for a person who does not exercise regularly. "Moderate" activities, like brisk walking, provide more benefits than low-intensity exercise because they raise the heart rate to a higher level. "Vigorous" activities, like jogging, increase the heart rate even more and burn more calories in a shorter time period compared to moderate activities. See box 5.1 for more examples of moderate and vigorous activities.

Box 5.1 Examples of Moderate and Vigorous Activities

Moderate Activities – When you do a moderate activity, your heart rate goes up. You should be able to talk comfortably. Typical examples include:

- Walking (3 -4 mph, but not race-walking)
- Water aerobics
- Bicycling at a casual pace
- Tennis (doubles)
- Ballroom dancing
- General gardening

Vigorous Activities–When you do a vigorous activity, you breathe harder and your heart rate is stronger. It may be difficult to speak more than a few words at a time. Examples include:

- Race walking, jogging, or running
- Swimming laps
- Tennis (singles)
- Aerobic dancing
- Bicycling fast or up hills
- Jumping rope
- Heavy gardening (continuous digging or hoeing)
- Hiking uphill or with a heavy backpack

Adults should get 150 minutes per week of *moderate* activity, or 75 minutes each week of *vigorous* activity or an equivalent combination of both (U.S. Department of Health and Human Services [HHS], 2008). It doesn't have to be all at once; you can add it up over the course of a day, though each activity should last for at least 10 minutes. Also, the guidelines recommend muscle-strengthening activities on two or more days a week.

Some Activity is Better than None at all–Keep in mind that doing any amount of physical activity provides health benefits. The idea is to *start* moving, *keep* moving, and *increase* activity until you reach your goals. See Box 5.2 for the specific guidelines for various groups.

Activity 5.2 — Assess Your Physical Activity
Refer to your Basic Nutrition Workbook and complete the activity.

Box 5.2 The 2008 Physical Activity Guidelines for Americans (U.S. Department of Health and Human Services, 2008)

2008 Physical Activity Guidelines for Americans

Key Guidelines for Children and Adolescents (ages 6 – 17)

- Children and adolescents should do **60 minutes (1 hour) or more of moderate or vigorous physical activity most days of the week.**
- Children and adolescents should include muscle-strengthening activities (such as playing on playground equipment, tug of war or climbing) at least 3 days a week, and bone-strengthening activities (such as jumping rope, skipping or hopping) at least 3 days of the week.
- Children should engage in activities that are enjoyable and age-appropriate.

Key Guidelines for Adults (ages 18 – 64)

- Some physical activity is better than none. Adults who participate in any amount of physical activity gain some health benefits.
- Adults should get at least **150 minutes of moderate activity per week**, or **75 minutes of vigorous activity per week**, or an equivalent combination of both. It doesn't have to be all at once; a person can add up activity over the course of a day, though each activity should last for at least 10 minutes.
- Adults should also do muscle-strengthening activities that involve all major muscle groups on two or more days a week.
- Adults who want even more health benefits should increase their aerobic physical activity to 300 minutes of moderate activity per week, or 150 minutes of vigorous activity per week, or an equivalent combination of both.

Key Guidelines for Women During Pregnancy and the Postpartum Period

- Healthy women who are not already highly active or doing vigorous-intensity activity should get at least 150 minutes of moderate-intensity aerobic activity per week during pregnancy and the postpartum period, or as directed by their health-care provider.
- Pregnant women who are highly active can continue physical activity during pregnancy and the postpartum period, provided that they remain healthy and discuss with their health-care provider how and when to adjust activity over time.

For guidelines for children under 6, refer to the Texas WIC *Preschool Nutrition Module*.
For guidelines pertaining to older adults, adults with chronic diseases, and adults with disabilities, refer to http://www.health.gov/paguidelines/.

Part 5

More Ways to Put Good Health into Practice

Now we'll look at some additional strategies that encourage healthy lifestyles. All of these concepts tie in closely with ideas that you'll find in the 2010 Dietary Guidelines, ChooseMyPlate.gov, and the 2008 Physical Activity Guidelines.

1. Eat Less, Move More.
2. Cook at home more often.
3. Dine out with your health in mind.
4. Limit screen time.
5. Practice food safety.
6. Practice mindful eating.
7. Control your portions.

Eat Less, Move More

One key message in the Dietary Guidelines is to lose weight by cutting back on calories while increasing physical activity. The best weight loss programs combine both – *eating less while moving more*.

Eat less. Eating less means eating smaller portions of a well-balanced diet — it doesn't mean skipping meals. A key strategy is to cut back on **empty-calorie foods** — foods that are high in calories, fat, and simple sugars, and low in vitamins, minerals and fiber. Examples include candy, doughnuts, pastries, cakes, cookies, and pies, as well as sugary drinks like sodas, fruit drinks, coffee beverages and sports drinks.

Added sugars and solid fats contribute about 800 extra calories to the average American's daily intake (USDA, 2010b). Alcohol is also a source of extra calories for many people. Here are some ways to cut back on calories:

- Drink fewer regular sodas, sports drinks, and energy drinks. Try water instead.
- Limit alcohol. If you choose to drink, do so in moderation.
- Try healthy food alternatives. Pizza is one of the top five sources of calories for Americans. It's loaded with solid fats, calories, and sodium. Try whole-grain crust, vegetable toppings, and less cheese.

- Eat fewer desserts and baked goods like cookies, cakes, pies, muffins and doughnuts. Choose fruit as a dessert more often.

As you cut back on empty-calorie foods, eat more **nutrient-dense foods** — foods that are naturally high in vitamins, minerals and fiber while low in calories and fat. Nutrient-dense foods offer many healthy nutrients per serving and really pack a punch for their size. Fruits, vegetables, whole grains, beans, and lean meats are a few good examples.

Move More. Staying active burns calories, which can help you lose weight. Physical activity also boosts your mood and helps keep your heart and muscles strong. Table 5.1 shows approximately how many calories you can burn doing common physical activities. Exercise doesn't have to be done in 30-minute increments — you can fit activities in throughout your day, moving your body for at least 10 minutes at a time. For adults who are inactive, remember that some physical activity is better than none.

Table 5.1 Calories Burned per Hour in Common Physical Activities

Moderate Activity	Approximate Calories burned in 30 minutes for a 154-lb. person
Stretching	90
Walking (3.5 mph)	140
Bicycling (<10 mph)	145
Golf (walking and carrying clubs)	165
Dancing	165
Light gardening/yard work	165
Hiking	185
Basketball (vigorous)	220
Weight lifting (vigorous effort)	220
Heavy yard work (chopping wood)	220
Walking (4.5 mph)	230
Aerobics	240
Swimming (slow freestyle laps)	255
Bicycling (>10 mph)	295
Running/jogging (5 mph)	295

Calories burned per hour will be higher for persons who weigh more than 154 lbs and lower for persons who weigh less.

Part 5

The healthiest, safest and best-tasting way to trim your waistline and adopt a healthier lifestyle is to eat more nutrient-dense foods and become more physically active. For every 3500 calories you cut out from your **calorie balance,** you will lose a pound of body fat. See Box 5.3 for a summary of how small changes can add up over time.

Box 5.3 Balancing Calories for a Healthier Weight

Think about this…

1 pound of body fat = 3,500 calories

What does this mean?

- For every additional 3,500 calories that you don't eat or that you burn from physical activity, you will *lose* one pound of fat.
- For every additional 3,500 extra calories you eat from food or do not burn through physical activity, you will *gain* one pound of fat.

Breaking it Down

3,500 is a big number, so it's easier to think about a single day. If you lower your total calorie balance by 500 calories each day, you will lose about one pound each week, which is a safe weight loss goal. Even a small calorie reduction per day can lead to a noticeable weight loss over the period of one month.

This chart shows how small changes can help you achieve weight loss goals:

If you reduce your calories by ___ per **day**	You will lose about ___ pounds per **week**	You will lose about ___ pounds per **month**
100	0.2	0.8
200	0.4	1.6
300	0.6	2.4
400	0.8	3.2
500	1	4

Cook at Home More Often

Homemade meals are often healthier than eating out because you can control the ingredients and the portion sizes. Try to cook and eat more meals at home with friends or family. Take time to explore recipes, substitute ingredients, and learn new ways to prepare lean meats, fruits, vegetables, and whole grains. Your meals will likely cost less per serving compared to dining out, and you can plan ahead for leftovers by cooking in large batches.

Eating at home also helps to create a healthy food environment for your family. Dinners with family or friends allow for bonding, sharing, and communication. Children who regularly eat dinner with their families do better in school and are less likely to do drugs and alcohol. They also feel more comfortable talking to parents about personal concerns (The National Center for Addiction and Substance Abuse at Columbia University, 2010).

Dine Out with Your Health in Mind

We all go out to eat from time to time, but that doesn't mean smart eating has to go out the window. Many restaurants have nutrition data available for customers, so be sure to ask for this information. Here are some ways you can be a smart diner:

- Choose dishes that include vegetables, fruits, and whole grains.
- Choose smaller portions, split your meal with somebody, or put aside half of the meal in a to-go box as soon as it's delivered.
- Avoid creamy, fried, breaded, battered, or buttered foods. Grilled, steamed, or broiled foods are better choices.
- Don't let toppings put you over the top! Keep portions of any toppings, including croutons, cheeses, syrups, dressings, and sauces small. Choose low-fat or light dressings and toppings whenever possible.

Limit Screen Time

It's hard to imagine a world without smart phones, laptops, and big-screen TVs. Our environment is full of technology, which contributes to unhealthy lifestyle habits and an epidemic of obesity. Many of us need to cut back on the time we spend watching television, using our smart phones and computers, or playing video games. This is especially true for children and adolescents, as there is a strong link between too much screen time and childhood obesity. The American Academy of Pediatrics (AAP) recommends no more than one to two hours of quality screen time per day for older children and discourages any screen time for children under the age of 2 (AAP, 2001). Use the time you would typically watch television to do other activities like family games or exercise.

Practice Food Safety

Preparing meals the safe way can help prevent food illnesses. Signs and symptoms of a foodborne illness may occur anywhere from 30 minutes to 3 weeks after eating a contaminated food (CDC, 2010a). The four basic principles of food safety include (USDA, 2010a):

- **Clean.** Wash hands, surfaces, utensils, and cuttings boards often. Rinse produce under tap water to remove visible dirt and dry it off with a clean towel before cutting or eating.
- **Separate.** Separate raw meat, seafood, and eggs from ready-to-eat foods to prevent cross contamination. Use different cutting boards, utensils, and plates for raw foods and cooked foods.
- **Cook.** Cook foods thoroughly to destroy harmful bacteria. Foods must reach certain temperatures in order to kill harmful microorganisms. For example, fish should be cooked to an internal temperature of 145°F and chicken should be cooked to 165°F. Use a food thermometer for the most accurate temperature reading. After cooking and preparing meals, keep cold foods cold (at or below 40°F) and hot foods hot (at or above 140°F).
- **Chill.** Bacteria grow very quickly at room temperature. Refrigerate or freeze leftovers within 2 hours.

Practice Mindful Eating

Good nutrition goes far beyond using the Dietary Guidelines to select, cook, and eat the right foods. Eating also involves the *mind* – emotions, feelings, behaviors and habits all influence our mealtimes. We don't usually stop to think about when, why, or how we eat. Eating habits are learned at a very young age and are often carried with us throughout our lifetime.

As Americans we often pride ourselves on our multi-tasking abilities. Our busy lifestyles (and eating habits) are often on the go. When we are distracted, rushed, or stressed, we may overeat. Why? Because our minds aren't focused on the food we're eating. Examples of mind-less eating include munching through an entire bag of chips during a movie; snacking when we're nervous, bored, or emotional; endlessly eating at a restaurant or social gathering just because the food is there; or always feeling a need to 'clean your plate' at mealtimes. Mindless eating involves eating without considering if you're really hungry. This can lead to overconsumption of high-calorie foods and beverages. Over time, these behaviors can contribute to weight gain, poor relationships with food, and long-term health consequences.

Good food habits involve mind *"full"* eating. **Mindful eating** involves being aware of the what, where, why, when, and how much you're eating. It helps us avoid the food scenarios mentioned above. It allows for a greater control of dietary intake and a better overall relationship with food.

Here are a few tips for eating more mindfully:

- **Be aware of your hunger cues.** Are you honestly hungry or are there other reasons you want to eat? Listen to your appetite and eat only until satisfied, not until you are full.
- **Keep healthy foods available for easy snacking.** Chopped fruits and vegetables are an easy, portable snack that will provide you with more nutrition than a candy bar or bag of chips.
- **Avoid eating directly out of a box, carton or cupboard.** Put your food on a plate and sit down to eat. You can control your portion sizes and reduce the temptation to continue eating.

- **Eat slowly.** Take time to enjoy the colors, smells, tastes and textures of your food. By savoring your food you will enjoy it more and eat less. This will also allow your body time to experience the feeling of fullness.
- **Put away distractions.** Try to avoid the television, computer, or phone during mealtimes as it may lead to overeating. Focus on the task of eating, the nourishment that the food is providing your body, and your satiety cues.

Control Your Portions

Our food sizes are growing in proportion with our waistbands. What used to be considered a normal serving fifty years ago is often considered 'kiddie-sized' today. As we've learned, bigger definitely doesn't mean better, and our health often pays the highest price. So what exactly does a **serving size** look like? Use these everyday visuals to help you decide. No measuring cups needed!

Baseball =1 Cup

Deck of Cards = 3 ounces

Yo Yo = ½ Cup

1 Poker Chip = 1 Tablespoon

Golf Ball =
¼ Cup or 4 Tablespoons

Pair of Dice = 1 ounce

Making Sense of it All

Healthy eating is not a one-size-fits-all approach, but the guidelines and tips in this module encourage the right balance of foods rather than fad dieting. Think about how you can make a difference in the lives of WIC families. Focus on helping participants eat more fruits and vegetables, whole grains, cut down on fat and sugar, be more active, and follow eating patterns that are in line with the latest dietary advice.

Part 5 Test: This is the end of Part 5. Go to your Basic Nutrition Workbook and complete the Part 5 test questions.


Try This!
Sock Puppet

Your Own Checklist for Good Health

Part 6

As a WIC employee it's important to know the latest guidelines for healthy living and to put them into practice. By practicing healthy habits you can be a role model for WIC clients and boost your chances of living a healthier and longer life yourself.

Objectives

After reading Part 6 you'll be able to:

- Distinguish between different body measurements that estimate body fat and predict risk for long-term disease.
- Demonstrate knowledge about the health effects of making healthy food choices and being physically active.
- List the risk factors for chronic diseases.
- Identify specific parameters for various chronic disease risk factors.

Part 6

In this part of the module you'll assess your own health, looking at these five areas:

- Being at a Healthy Weight
- Choosing Healthy Foods
- Being Physically Active
- Managing other Risk Factors
- Setting Goals for a Healthy Lifestyle

Think of this section as a self-assessment — a snapshot of where are you today. When you're done, you can decide what you're going to do with the information if anything. Maybe you'll want to start planning some changes. Or maybe you're already following a healthy lifestyle. Regardless, taking this time to look at your own health will give you a better understanding of ways you can help WIC clients make healthier choices.

Being at a Healthy Weight

Many people want to be at a healthy weight so that they look slimmer. That's important, but there's more to body weight than what you see in the mirror. It's your *health* that's on the line.

Being overweight or obese raises your risk of heart disease, high blood pressure, stroke, type 2 diabetes, breathing problems, arthritis, gallbladder disease, sleep apnea, and some cancers (CDC, 2011a). On the flipside, being too thin raises the risk of osteoporosis, nutrient deficiencies, and menstrual irregularities in women. But being at a healthy weight means you have a lower risk of all these problems. In other words, if you're at a healthy weight, you're healthier overall.

In this section you will figure out your own Body Mass Index (BMI) and your waist circumference.

Body Mass Index (BMI)

BMI is a measure of your weight based on your height. A high BMI suggests that a person has extra body fat, which means a greater risk of heart disease and other diseases. Here's the mathematical equation to figure out BMI:

BMI = weight (in pounds) ÷ height (in inches)^2 x 703

There are four standard weight categories based on the BMI values. After calculating a person's BMI, you need to determine which weight category they are in.

BMI	Weight Category
below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and above	Obese

Activity6.1 — Determine Your BMI.
Go to your Basic Nutrition Workbook and complete the activity.

BMI Doesn't Tell the Whole Story—In general, the higher the BMI the more body fat a person has. But that's not always the case (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2008). For example, a highly-trained very muscular athlete can be "overweight" according to his BMI, but his body is mostly muscle with very little fat.

The *opposite* is also true — many adults who are "normal weight" based on their BMI actually have a *high* amount of body fat. In other words, even though their BMI is normal they have a higher risk of heart disease and other long-term diseases (Romero-Corral et al., 2010). Researchers use the term "*normal weight obesity*" to describe people who have a normal BMI but a high body fat percentage.

Waist Circumference

While BMI helps tell us if we're carrying extra fat, **waist circumference** helps to show where the excess fat is located. In general, women carry fat in their hips and buttocks giving them a "pear" shape. Men usually build up fat around their bellies and waist so that they have more of an "apple" shape.

If you store extra fat mainly around your waist ("apple-shaped"), you are more likely to develop health problems than if you carry fat mainly in your hips and thighs even if your BMI is in the healthy range. Women with a waist measurement **over 35 inches** and men with a waist measurement **over 40 inches** may have more health risks because of their body fat distribution (NIDDK, 2008).

BMI is a good screening tool, but it is not a direct measurement of body fat. Knowing a person's waist circumference provides more information.

Activity 6.2 — Measure Your Waist Circumference. Go to your Basic Nutrition Workbook and complete the activity.

What is Your Weight Status?

BMI and waist circumference provide a basic assessment of weight status. At this point, consider your weight status and think about what sort of goals you might to set for yourself (see below).

Are you underweight? If your BMI is 18.5 or less, you may want to talk with your doctor to see if you need to gain weight. This is especially true if you've recently lost 10 or more pounds without trying to lose weight.

Are you overweight or obese? Consider talking with your doctor about ways to eat healthier and be more physically active if:

- Your BMI is 30 or above.
- Your BMI is between 25 and 30 and you have two or more of the following health problems: type 2 diabetes, high blood pressure, heart disease, stroke, cancer, sleep apnea, osteoarthritis, gallbladder disease, liver disease, or irregular menstrual periods.
- You have a high waist size and two or more of the health problems listed above.

Even a small weight loss of 10% of current weight can lower your risk of obesity-related diseases. It's also important to try to avoid gaining any additional weight.

Do you have a healthy weight and waist size? That's good news, but it's still important to ask yourself some serious questions. Are you eating the right foods? Are you physically active? Do you do some kind of strength training several times a week? Even people at a healthy weight status can usually find ways to live a healthier lifestyle. Keep in mind that as you age your energy needs will probably decrease and staying at your current weight can get harder. In fact, the average American gains about a pound a year between the ages of 20 to 60 years. Some gain more. So if you're at a healthy weight now, your goal should be to stay that way.

Choosing Healthy Foods

The food choices we make each day add up. Over months and years, poor choices can lead to disease while a lifetime of healthy choices can help prevent all kinds of health problems, especially as we age. So why don't we all eat a healthy diet? Obviously many factors affect our daily food choices including:

- **Personal preferences.** Your food preferences the foods you were raised on, and your basic "food philosophy" form the basis of your diet.
- **Health status.** Being pregnant, losing weight, having diabetes, and battling cancer are examples of health issues that affect nutrient needs and food choices.
- **Advice from friends, family and the media.** Nutrition advice is everywhere — some of it is good, but there's also a lot of misinformation too.
- **Interest in food and cooking.** People who enjoy cooking tend to be more adventurous when it comes to trying different foods and cooking them at home.
- **Family and working situations.** A single mother of two who works full-time may choose foods differently than a stay-at-home parent who can spend more time planning, shopping, and cooking meals.

Try This!
Use an Online Nutrient Calculator (optional)

The main reason for choosing healthy foods is to get the nutrients you need. Try this on-line tool from the Food and Nutrition Information Council — it calculates your nutrient needs based on age, sex, physical activity and pregnancy/ lactation status.

Go to the "Interactive DRI for Healthcare Professionals" at http://fnic.nal.usda.gov/interactiveDRI/ and enter the data as it pertains to you. Get a detailed list of all your nutrient needs as well as links to additional resources like fact sheets, the Dietary Guidelines, and more.

- **Cues and signals.** Hunger is one cue that influences our food choices, but there are many others. Things like packaging, colors, labels, shapes, smells, appearance, serving size, plate size, etc., can all affect your decisions about which foods to eat, when to eat them and how much to eat.

Activity 6.3 — Rate Your Plate.
Go to your Basic Nutrition Workbook and complete the activity.

Being Physically Active

"Being physically active is one of the most important steps you can take to improve your health."

— Centers for Disease Control and Prevention, 2011(b) —

Now go back and read that sentence again. Let it sink in; really sink in. That's a pretty strong statement isn't it? Yet most Americans don't do enough physical activity to meet public health guidelines. In Part 5 of this module you assessed how much physical activity you're doing each day. If you're like most Americans you need to do more.

Just Move. First remember that some activity is better than none at all. Moving your body, even if you're just doing light activity, has important benefits. So take the stairs, park further away, and play outside with the kids! It's all helpful!

Take the First Step! If you're ready to start being more active, then take that first step — literally. Ask anyone who has transformed themselves from couch potato to an active person — they all took a first step. Whether it was stepping out the door to start walking, stepping onto the treadmill to start jogging, or stepping into the pool to start swimming, it all starts with the first step.

So why not start today? Find 10 minutes today to walk around the block, jog in the park, or dance to the radio in your living room. You'll feel good about yourself knowing you took the first step.

Activity 6.4 — Think About Being Physically Active.
Go to your Basic Nutrition Workbook and complete the activity.

Knowing Your Other Risk Factors

In addition to your weight status, activity level, and eating habits, other factors can also affect your risk for chronic diseases like **cardiovascular disease** and diabetes. These factors include:

- High blood pressure
- High cholesterol and triglycerides
- High blood glucose
- Family history
- Tobacco use

High Blood Pressure (Hypertension)

There is pressure against the artery walls as blood travels through your arteries a lot like the pressure of water in a water hose. It's normal for your blood pressure to go up and down during the day, but if it's high all the time it can harm your heart, kidneys, blood vessels, and other body parts.

Approximately 33% of U.S. adults have **hypertension** and 30% of American adults have **prehypertension** — blood pressure numbers that are higher than normal but not yet in the hypertension range (American Heart Association, 2011). People with high blood pressure usually don't have symptoms so people often don't realize they have it. That's why you should get your blood pressure checked on a regular basis.

There are two numbers in a blood pressure measurement. The top (systolic) number is the pressure in your blood vessels when your heart beats. The bottom (diastolic) number is the pressure in your vessels when your heart rests between beats. **A normal blood pressure is 120/80 mm HG or lower** (National Heart, Lung and Blood Institute).

Eating a healthy diet, cutting back on sodium, reaching a healthy weight, staying active and lowering your stress level can help to lower a person's blood pressure. If you don't know your blood pressure, get it checked. For more information, go to http://www.cdc.gov/bloodpressure/.

Blood Cholesterol, Lipoproteins, and Triglycerides

Our bodies use cholesterol to make hormones, cell walls, bile, and vitamin D. But cholesterol can build up in the blood vessels. This buildup is called **plaque**. Over time, plaque can make the arteries narrow and increases the chance of a heart attack. That's why it's good to know the levels of cholesterol in your blood. A blood test can measure total blood cholesterol, lipoprotein, and triglyceride levels:

What are lipoproteins?
In order for cholesterol to travel through your blood, it's coated with a layer of protein to make a "lipoprotein." Low-density lipoprotein (LDL) and high-density lipoprotein (HDL) are two of the common lipoproteins. Your diet, activity level, and genetics can all affect your lipoprotein levels.

Total cholesterol is the total amount of cholesterol in your blood. It includes HDL, LDL, and other lipoproteins that carry cholesterol through the blood.

LDL (bad) cholesterol — When LDL cholesterol is high, more plaque builds up in the arteries, raising your risk for heart disease. That's why LDL cholesterol is called "bad" cholesterol.

HDL (good) cholesterol helps remove cholesterol from the blood and prevent the fatty buildup, so this is the "good" cholesterol. Higher numbers are better.

Triglycerides are another fat in your blood that can also raise your heart disease risk. Ideally you want your fasting triglyceride level to be less than 150 mg/dL. Things that raise triglycerides include being overweight, physical inactivity, cigarette smoking, excessive alcohol use, very high carbohydrate diets, certain diseases and drugs, and genetic disorders.

Desirable Cholesterol Levels (fasting)	
Total Cholesterol	Less than 200 mg/dL
LDL Cholesterol ("Bad" Cholesterol)	Less than 100 mg/dL
HDL Cholesterol ("Good" Cholesterol)	60 mg/dL or highter
Triglycerides	Less than 150 mg/dL

High cholesterol is a concern for America. As of 2008, approximately 44% of adults over 20 have total cholesterol levels at or above 200 (American Heart Association, 2011). Eating a healthy diet, reaching a healthy weight, and staying active can help to improve levels of cholesterol and triglycerides.

High Blood Glucose

If your blood glucose (or blood sugar) is *higher* than normal, that's a sign that you may have **diabetes.** The number of Americans being diagnosed with diabetes continues to rise every year as does the number of children who develop diabetes. Diabetes can lead to heart disease, blindness, kidney failure, and amputation of feet and legs. Diabetes is the seventh leading cause of death in the United States.

People with **prediabetes** have blood glucose levels higher than normal but not high enough to be classified as diabetes. The CDC estimates that 35% of the U.S. population has prediabetes (CDC, 2011b), yet most people with prediabetes don't realize they have it (CDC, 2008). If you have prediabetes, you have an increased risk of developing type 2 diabetes and a higher risk of heart disease and stroke.

What causes high levels of blood sugar? When you eat food, your body turns most of it into glucose. Normally a hormone called insulin moves the glucose into the body's cells where they use it for energy. But if you have diabetes your body either doesn't make enough insulin or doesn't use insulin as well as it should. The result? Glucose builds up in the blood. And that's why many people with diabetes take oral medications or insulin shots. They need an outside source of insulin to keep their blood glucose levels normal. Eating a healthy diet, reaching a healthy weight, and staying active can help to lower a person's risk of getting diabetes, and can help improve a diabetic's blood glucose levels.

Diagnosing diabetes — Physicians use several different blood tests to see if a person's blood glucose is higher than normal. The most common test is a fasting blood glucose test which measures your blood glucose after not eating for at least 8 hours. A normal reading is less than 100 mg/dL. For more information about other diagnostic tests, treatment and management of diabetes, refer to the National Diabetes Information Clearinghouse website at http://diabetes.niddk.nih.gov/.

For more information about cholesterol, check out **"High Blood Cholesterol: What You Need to Know"** from the National Cholesterol Education Program: http://www.nhlbi.nih.gov/health/public/heart/chol/wyntk.pdf. The information explains what your cholesterol numbers mean, how to calculate your heart disease risk, and how you can make healthy changes to your diet.

Do you know what your fasting blood glucose level is? About 35% of Americans have prediabetes, but most don't realize they have it.

Your Own Checklist for Good Health

Part 6

As a WIC employee it's important to know the latest guidelines for healthy living and to put them into practice. By practicing healthy habits you can be a role model for WIC clients and boost your chances of living a healthier and longer life yourself.

Objectives

After reading Part 6 you'll be able to:

- Distinguish between different body measurements that estimate body fat and predict risk for long-term disease.
- Demonstrate knowledge about the health effects of making healthy food choices and being physically active.
- List the risk factors for chronic diseases.
- Identify specific parameters for various chronic disease risk factors.

Part 6

In this part of the module you'll assess your own health, looking at these five areas:

- Being at a Healthy Weight
- Choosing Healthy Foods
- Being Physically Active
- Managing other Risk Factors
- Setting Goals for a Healthy Lifestyle

Think of this section as a self-assessment — a snapshot of where are you today. When you're done, you can decide what you're going to do with the information if anything. Maybe you'll want to start planning some changes. Or maybe you're already following a healthy lifestyle. Regardless, taking this time to look at your own health will give you a better understanding of ways you can help WIC clients make healthier choices.

Being at a Healthy Weight

Many people want to be at a healthy weight so that they look slimmer. That's important, but there's more to body weight than what you see in the mirror. It's your *health* that's on the line.

Being overweight or obese raises your risk of heart disease, high blood pressure, stroke, type 2 diabetes, breathing problems, arthritis, gallbladder disease, sleep apnea, and some cancers (CDC, 2011a). On the flipside, being too thin raises the risk of osteoporosis, nutrient deficiencies, and menstrual irregularities in women. But being at a healthy weight means you have a lower risk of all these problems. In other words, if you're at a healthy weight, you're healthier overall.

In this section you will figure out your own Body Mass Index (BMI) and your waist circumference.

Body Mass Index (BMI)

BMI is a measure of your weight based on your height. A high BMI suggests that a person has extra body fat, which means a greater risk of heart disease and other diseases. Here's the mathematical equation to figure out BMI:

BMI = weight (in pounds) ÷ height (in inches)^2 x 703

There are four standard weight categories based on the BMI values. After calculating a person's BMI, you need to determine which weight category they are in.

BMI	Weight Category
below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and above	Obese

Activity6.1 — Determine Your BMI.
Go to your Basic Nutrition Workbook and complete the activity.

BMI Doesn't Tell the Whole Story—In general, the higher the BMI the more body fat a person has. But that's not always the case (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2008). For example, a highly-trained very muscular athlete can be "overweight" according to his BMI, but his body is mostly muscle with very little fat.

The *opposite* is also true — many adults who are "normal weight" based on their BMI actually have a *high* amount of body fat. In other words, even though their BMI is normal they have a higher risk of heart disease and other long-term diseases (Romero-Corral et al., 2010). Researchers use the term "*normal weight obesity*" to describe people who have a normal BMI but a high body fat percentage.

Waist Circumference

While BMI helps tell us if we're carrying extra fat, **waist circumference** helps to show where the excess fat is located. In general, women carry fat in their hips and buttocks giving them a "pear" shape. Men usually build up fat around their bellies and waist so that they have more of an "apple" shape.

If you store extra fat mainly around your waist ("apple-shaped"), you are more likely to develop health problems than if you carry fat mainly in your hips and thighs even if your BMI is in the healthy range. Women with a waist measurement **over 35 inches** and men with a waist measurement **over 40 inches** may have more health risks because of their body fat distribution (NIDDK, 2008).

BMI is a good screening tool, but it is not a direct measurement of body fat. Knowing a person's waist circumference provides more information.

Activity 6.2 — Measure Your Waist Circumference. Go to your Basic Nutrition Workbook and complete the activity.

What is Your Weight Status?

BMI and waist circumference provide a basic assessment of weight status. At this point, consider your weight status and think about what sort of goals you might to set for yourself (see below).

Are you underweight? If your BMI is 18.5 or less, you may want to talk with your doctor to see if you need to gain weight. This is especially true if you've recently lost 10 or more pounds without trying to lose weight.

Are you overweight or obese? Consider talking with your doctor about ways to eat healthier and be more physically active if:

- Your BMI is 30 or above.
- Your BMI is between 25 and 30 and you have two or more of the following health problems: type 2 diabetes, high blood pressure, heart disease, stroke, cancer, sleep apnea, osteoarthritis, gallbladder disease, liver disease, or irregular menstrual periods.
- You have a high waist size and two or more of the health problems listed above.

Even a small weight loss of 10% of current weight can lower your risk of obesity-related diseases. It's also important to try to avoid gaining any additional weight.

Do you have a healthy weight and waist size? That's good news, but it's still important to ask yourself some serious questions. Are you eating the right foods? Are you physically active? Do you do some kind of strength training several times a week? Even people at a healthy weight status can usually find ways to live a healthier lifestyle. Keep in mind that as you age your energy needs will probably decrease and staying at your current weight can get harder. In fact, the average American gains about a pound a year between the ages of 20 to 60 years. Some gain more. So if you're at a healthy weight now, your goal should be to stay that way.

Choosing Healthy Foods

The food choices we make each day add up. Over months and years, poor choices can lead to disease while a lifetime of healthy choices can help prevent all kinds of health problems, especially as we age. So why don't we all eat a healthy diet? Obviously many factors affect our daily food choices including:

- **Personal preferences.** Your food preferences the foods you were raised on, and your basic "food philosophy" form the basis of your diet.
- **Health status.** Being pregnant, losing weight, having diabetes, and battling cancer are examples of health issues that affect nutrient needs and food choices.
- **Advice from friends, family and the media.** Nutrition advice is everywhere — some of it is good, but there's also a lot of misinformation too.
- **Interest in food and cooking.** People who enjoy cooking tend to be more adventurous when it comes to trying different foods and cooking them at home.
- **Family and working situations.** A single mother of two who works full-time may choose foods differently than a stay-at-home parent who can spend more time planning, shopping, and cooking meals.

Try This!
Use an Online Nutrient Calculator (optional)

The main reason for choosing healthy foods is to get the nutrients you need. Try this on-line tool from the Food and Nutrition Information Council — it calculates your nutrient needs based on age, sex, physical activity and pregnancy/ lactation status.

Go to the "Interactive DRI for Healthcare Professionals" at http://fnic.nal.usda.gov/interactiveDRI/ and enter the data as it pertains to you. Get a detailed list of all your nutrient needs as well as links to additional resources like fact sheets, the Dietary Guidelines, and more.

- **Cues and signals.** Hunger is one cue that influences our food choices, but there are many others. Things like packaging, colors, labels, shapes, smells, appearance, serving size, plate size, etc., can all affect your decisions about which foods to eat, when to eat them and how much to eat.

Activity 6.3 — Rate Your Plate.
Go to your Basic Nutrition Workbook and complete the activity.

Being Physically Active

"Being physically active is one of the most important steps you can take to improve your health."

— Centers for Disease Control and Prevention, 2011(b) —

Now go back and read that sentence again. Let it sink in; really sink in. That's a pretty strong statement isn't it? Yet most Americans don't do enough physical activity to meet public health guidelines. In Part 5 of this module you assessed how much physical activity you're doing each day. If you're like most Americans you need to do more.

Just Move. First remember that some activity is better than none at all. Moving your body, even if you're just doing light activity, has important benefits. So take the stairs, park further away, and play outside with the kids! It's all helpful!

Take the First Step! If you're ready to start being more active, then take that first step — literally. Ask anyone who has transformed themselves from couch potato to an active person — they all took a first step. Whether it was stepping out the door to start walking, stepping onto the treadmill to start jogging, or stepping into the pool to start swimming, it all starts with the first step.

So why not start today? Find 10 minutes today to walk around the block, jog in the park, or dance to the radio in your living room. You'll feel good about yourself knowing you took the first step.

Activity 6.4 — Think About Being Physically Active.
Go to your Basic Nutrition Workbook and complete the activity.

Knowing Your Other Risk Factors

In addition to your weight status, activity level, and eating habits, other factors can also affect your risk for chronic diseases like **cardiovascular disease** and diabetes. These factors include:

- High blood pressure
- High cholesterol and triglycerides
- High blood glucose
- Family history
- Tobacco use

High Blood Pressure (Hypertension)

There is pressure against the artery walls as blood travels through your arteries a lot like the pressure of water in a water hose. It's normal for your blood pressure to go up and down during the day, but if it's high all the time it can harm your heart, kidneys, blood vessels, and other body parts.

Approximately 33% of U.S. adults have **hypertension** and 30% of American adults have **prehypertension** — blood pressure numbers that are higher than normal but not yet in the hypertension range (American Heart Association, 2011). People with high blood pressure usually don't have symptoms so people often don't realize they have it. That's why you should get your blood pressure checked on a regular basis.

There are two numbers in a blood pressure measurement. The top (systolic) number is the pressure in your blood vessels when your heart beats. The bottom (diastolic) number is the pressure in your vessels when your heart rests between beats. **A normal blood pressure is 120/80 mm HG or lower** (National Heart, Lung and Blood Institute).

Eating a healthy diet, cutting back on sodium, reaching a healthy weight, staying active and lowering your stress level can help to lower a person's blood pressure. If you don't know your blood pressure, get it checked. For more information, go to http://www.cdc.gov/bloodpressure/.

Blood Cholesterol, Lipoproteins, and Triglycerides

Our bodies use cholesterol to make hormones, cell walls, bile, and vitamin D. But cholesterol can build up in the blood vessels. This buildup is called **plaque**. Over time, plaque can make the arteries narrow and increases the chance of a heart attack. That's why it's good to know the levels of cholesterol in your blood. A blood test can measure total blood cholesterol, lipoprotein, and triglyceride levels:

What are lipoproteins?
In order for cholesterol to travel through your blood, it's coated with a layer of protein to make a "lipoprotein." Low-density lipoprotein (LDL) and high-density lipoprotein (HDL) are two of the common lipoproteins. Your diet, activity level, and genetics can all affect your lipoprotein levels.

Total cholesterol is the total amount of cholesterol in your blood. It includes HDL, LDL, and other lipoproteins that carry cholesterol through the blood.

LDL (bad) cholesterol — When LDL cholesterol is high, more plaque builds up in the arteries, raising your risk for heart disease. That's why LDL cholesterol is called "bad" cholesterol.

HDL (good) cholesterol helps remove cholesterol from the blood and prevent the fatty buildup, so this is the "good" cholesterol. Higher numbers are better.

Triglycerides are another fat in your blood that can also raise your heart disease risk. Ideally you want your fasting triglyceride level to be less than 150 mg/dL. Things that raise triglycerides include being overweight, physical inactivity, cigarette smoking, excessive alcohol use, very high carbohydrate diets, certain diseases and drugs, and genetic disorders.

Desirable Cholesterol Levels (fasting)	
Total Cholesterol	Less than 200 mg/dL
LDL Cholesterol ("Bad" Cholesterol)	Less than 100 mg/dL
HDL Cholesterol ("Good" Cholesterol)	60 mg/dL or highter
Triglycerides	Less than 150 mg/dL

High cholesterol is a concern for America. As of 2008, approximately 44% of adults over 20 have total cholesterol levels at or above 200 (American Heart Association, 2011). Eating a healthy diet, reaching a healthy weight, and staying active can help to improve levels of cholesterol and triglycerides.

High Blood Glucose

If your blood glucose (or blood sugar) is *higher* than normal, that's a sign that you may have **diabetes.** The number of Americans being diagnosed with diabetes continues to rise every year as does the number of children who develop diabetes. Diabetes can lead to heart disease, blindness, kidney failure, and amputation of feet and legs. Diabetes is the seventh leading cause of death in the United States.

People with **prediabetes** have blood glucose levels higher than normal but not high enough to be classified as diabetes. The CDC estimates that 35% of the U.S. population has prediabetes (CDC, 2011b), yet most people with prediabetes don't realize they have it (CDC, 2008). If you have prediabetes, you have an increased risk of developing type 2 diabetes and a higher risk of heart disease and stroke.

What causes high levels of blood sugar? When you eat food, your body turns most of it into glucose. Normally a hormone called insulin moves the glucose into the body's cells where they use it for energy. But if you have diabetes your body either doesn't make enough insulin or doesn't use insulin as well as it should. The result? Glucose builds up in the blood. And that's why many people with diabetes take oral medications or insulin shots to help keep their blood glucose levels normal. Eating a healthy diet, reaching a healthy weight, and staying active can help to lower a person's risk of getting diabetes, and can help improve a diabetic's blood glucose levels.

Diagnosing diabetes — Physicians use several different blood tests to see if a person's blood glucose is higher than normal. The most common test is a fasting blood glucose test which measures your blood glucose after not eating for at least 8 hours. A normal reading is less than 100 mg/dL. For more information about other diagnostic tests, treatment and management of diabetes, refer to the National Diabetes Information Clearinghouse website at http://diabetes.niddk.nih.gov/.

For more information about cholesterol, check out **"High Blood Cholesterol: What You Need to Know"** from the National Cholesterol Education Program: http://www.nhlbi.nih.gov/health/public/heart/chol/wyntk.pdf. The information explains what your cholesterol numbers mean, how to calculate your heart disease risk, and how you can make healthy changes to your diet.

Do you know what your fasting blood glucose level is? About 35% of Americans have prediabetes, but most don't realize they have it.

Tobacco Use

If you smoke you are at a higher risk of having a stroke, a heart attack, vascular disease, and an aneurysm. Smoking raises your heart rate, tightens your arteries, increases your blood pressure, and makes your heart work harder. What's more, the tar and carbon monoxide from cigarettes can cause plaque to build up in your arteries, and affect the level of blood clotting factors in your blood, raising your risk of a blood clot (National Institute on Drug Abuse [NIDA], 2010).

And that's not all — tobacco causes one-third of all cancers and 90 percent of lung cancer cases. Smoking can also lead to lung diseases such as chronic bronchitis and emphysema, and it is linked to leukemia, cataracts, and pneumonia. On average, adults who smoke die 14 years earlier than nonsmokers (NIDA, 2010).

Ready to quit? Then contact the Texas Quitline at www.yesquit.com or 1-877-YES QUIT (1-877-937-7848). The program is free and confidential, and includes personal phone counseling sessions, reading materials, and if available, participants can receive 8 weeks worth of free patches, gum or lozenges designed to help smokers quit.

Family History

You can't change the genes you inherited, but hopefully you can try to avoid or lower your risk for any health problems that are part of your family history. If possible, find out as much as you can about the health histories of your parents, grandparents and siblings. Your health-care provider can help you learn what kinds of preventive steps you can take based on your family's health history.

Activity 6.5 — Check Your Family Health History.
Go to your Basic Nutrition Workbook and complete the activity.

Other Risk Factors

Other factors like stress, depression, mental health issues, and alcohol and drug abuse can affect your health and risk for disease. If you or a family member is suffering from one or more of these problems it's important to know that you're not alone. There is help available, and reaching out for help just might save your life or the life of a loved one. Talk to your health-care provider or contact your employer about their Employee Assistance Program.

Setting Goals for a Healthy Lifestyle

How do you feel about your weight? Do you want to do more physical activity? Do you have risk factors you can change? In this last activity, you will take a close look at your health habits and then create at least one personal health goal. After the goal-setting exercise, complete the test for Part 6.

Activity 6.6 — Health Habit Inventory/Goal.
Go to your Basic Nutrition Workbook and complete the activity.

Part 6 Test: This is the end of Part 6. Go to your Basic Nutrition Workbook and complete the Part 6 test questions.

Part 6

Tobacco Use

If you smoke you are at a higher risk of having a stroke, a heart attack, vascular disease, and an aneurysm. Smoking raises your heart rate, tightens your arteries, increases your blood pressure, and makes your heart work harder. What's more, the tar and carbon monoxide from cigarettes can cause plaque to build up in your arteries, and affect the level of blood clotting factors in your blood, raising your risk of a blood clot (National Institute on Drug Abuse [NIDA], 2010).

And that's not all — tobacco causes one-third of all cancers and 90 percent of lung cancer cases. Smoking can also lead to lung diseases such as chronic bronchitis and emphysema, and it is linked to leukemia, cataracts, and pneumonia. On average, adults who smoke die 14 years earlier than nonsmokers (NIDA, 2010).

Ready to quit? Then contact the Texas Quitline at www.yesquit.com or 1-877-YES QUIT (1-877-937-7848). The program is free and confidential, and includes personal phone counseling sessions, reading materials, and if available, participants can receive 8 weeks worth of free patches, gum or lozenges designed to help smokers quit.

Family History

You can't change the genes you inherited, but hopefully you can try to avoid or lower your risk for any health problems that are part of your family history. If possible, find out as much as you can about the health histories of your parents, grandparents and siblings. Your health-care provider can help you learn what kinds of preventive steps you can take based on your family's health history.

Activity 6.5 — Check Your Family Health History.
Go to your Basic Nutrition Workbook and complete the activity.

Other Risk Factors

Other factors like stress, depression, mental health issues, and alcohol and drug abuse can affect your health and risk for disease. If you or a family member is suffering from one or more of these problems it's important to know that you're not alone. There is help available, and reaching out for help just might save your life or the life of a loved one. Talk to your health-care provider or contact your employer about their Employee Assistance Program.

Setting Goals for a Healthy Lifestyle

How do you feel about your weight? Do you want to do more physical activity? Do you have risk factors you can change? In this last activity, you will take a close look at your health habits and then create at least one personal health goal. After the goal-setting exercise, complete the test for Part 6.

Activity 6.6 — Health Habit Inventory/Goal.
Go to your Basic Nutrition Workbook and complete the activity.

Part 6 Test: This is the end of Part 6. Go to your Basic Nutrition Workbook and complete the Part 6 test questions.

References

American Academy of Pediatrics (2001, February). Children, adolescents and television. *Pediatrics, 107*(2), 423-426. Retrieved from http://aappolicy.aappublications.org/cgi/reprint/pediatrics;107/2/423.pdf

American Heart Association (2009). *Meet the fats. Some are bad, some are better*. Retrieved from http://www.heart.org/idc/groups/heart-public/@wcm/@global/documents/downloadable/ucm_305572.pdf

American Heart Association (2011). Heart disease and stroke statistics—2011 update: a report from the American Heart Association. *Journal of the American Heart Association,* 123:e18-e209. Retrieved from http://circ.ahajournals.org/content/123/4/e18.full.pdf . DOI: 10.1161/CIR.0b013e3182009701

Appel, L. J., Frohlich, E. D., Hall, J. E., Pearson, T. A., Sacco, R. L., Seals, D. R., Sacks, F. M., Smith Jr., S. C., Vafiadis, D. K., & Van Horn, L. V. (2011, March). The importance of population-wide sodium reduction as a means to prevent cardiovascular disease and stroke: a call to action from the American Heart Association. *Journal of the American Heart Association*. doi:10.1161/CIR.0b013e31820d0793.

Bailey, R., Burt, V., Hughes, J., Yetley, E., Dwyer, J., Picciano, M.,... Sempos, C. (2011, April). Dietary supplement use among U.S. adults has increased since NHANES III (1988–1994). *NCHS Data Brief,* 61. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db61.htm

Bryant, Charles W. (2008). *How long can you go without food and water?* HowStuffWorks.com. Retrieved from http://health.howstuffworks.com/diseases-conditions/death-dying/live-without-food-and-water.htm

California Department of Public Health WIC Program (2008, September). *My wellness journal.* Retrieved from http://www.cdph.ca.gov/programs/wicworks/Documents/HealthyHabits/WIC-HH4L-WellnessJournal.pdf

Center for Science in the Public Interest (2008). *Salt assault: brand name comparisons of processed foods(2).* Retrieved from http://www.cspinet.org/new/pdf/salt_report_update.pdf

Centers for Disease Control and Prevention (2008, November). Self-reported prediabetes and risk-reduction activities — United States, 2006. *CDC MMWR Weekly 57(*44);1203-1205. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5744a3.htm

References

Centers for Disease Control and Prevention (2010a, December). *Foodborne illness*. Retrieved from http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodborneinfections_g.htm

Centers for Disease Control and Prevention (2010b, July). *Food deserts*. Retrieved from http://www.cdc.gov/Features/FoodDeserts/

Centers for Disease Control and Prevention (2010c, April). *Nutrition for everyone: protein*. Retrieved from http://www.cdc.gov/nutrition/everyone/basics/protein.html

Centers for Disease Control and Prevention (2010d, April). *Nutrition for everyone: trans fat*. Retrieved from http://www.cdc.gov/nutrition/everyone/basics/fat/transfat.html

Centers for Disease Control and Prevention (2011a, February). *Assessing your weight*. Retrieved from http://www.cdc.gov/healthyweight/assessing/index.html

Centers for Disease Control and Prevention (2011b, February). *Physical activity for everyone: physical activity and health*. Retrieved from http://www.cdc.gov/physicalactivity/everyone/health/index.html

Centers for Disease Control and Prevention (2011b). *National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011*. Retrieved from: http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2011.pdf

Cordero, A., Berry R. J., Boyle, C., Dietz, W., Johnston Jr., R., Leighton, J., & Popovic, T. (2010, August). CDC Grand Rounds: additional opportunities to prevent neural tube defects with folic acid fortification. *Morbidity and Mortality Weekly Report,* 59(31), 980-984.

East Carolina University, Brody School of Medicine, Department of Family Medicine. (n.d.). *Physical activity assessment*. Retrieved from http://www.ecu.edu/cs-dhs/fammed/customcf/resources/fitness/physical_activity_assessment.pdf

Ginde, A. A., Liu, M. C., & Camargo, C. A. (2009, March). Demographic Differences and Trends of Vitamin D Insufficiency in the US Population, 1988-2004. *Archives of Internal Medicine, 169*(6), 626-632.

Higdon, J. (2005). Whole Grains. *Linus Pauling Institute Micronutrient Information Center*. Retrieved from http://lpi.oregonstate.edu/infocenter/foods/grains/index.html#disease_prevention

References

Institute of Medicine [IOM] (2005a). *Dietary reference intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids*. Retrieved from http://www.nap.edu/openbook.php?isbn=0309085373

Institute of Medicine (2005b). Potassium. *Dietary reference intakes for water, potassium, sodium chloride, and sulfate*, 186-268. Retrieved from http://www.nap.edu/openbook.php?record_id=10925&page=R1

Jacobs D. ,Marquart L., Slavin J., Kushi L. (1998). Whole-grain intake and cancer: an expanded review and meta-analysis. *Nutr Cancer,* 30(2), 85-96. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/9589426

Looker, A. C., Johnson C. L., Lacher, D. A., Pfeiffer, C. M., Schleicher, R. L., & Sempos, C.T. (2011, March). Vitamin D Status: United States, 2001-2006. *National Center for Health Statistics Data Brief,* 59.

Mattes, R. D., & Donnelly, D. (1991). Relative contributions of dietary sodium sources. *Journal of the American College of Nutrition,* 10(4), 383-393.

Mayo Foundation for Medical Education and Research (2010, April). *Nutrition and healthy eating, calorie calculator*. Retrieved from http://www.mayoclinic.com/health/calorie-calculator/NU00598

Mayo Foundation for Medical Education and Research (2011a, February). *Dietary fats: know which ones to choose*. Retrieved from http://www.mayoclinic.com/health/fat/NU00262

Mayo Foundation for Medical Education and Research (2011b, March). *Sodium: How to tame your salt habit now*. Retrieved from http://www.mayoclinic.com/health/sodium/NU00284

MedlinePlus (2009). *Dehydration*. Retrieved from http://www.nlm.nih.gov/medlineplus/ency/article/000982.htm

National Academy of Sciences, Institute of Medicine Food and Nutrition Board (2011). *Dietary Reference Intakes: recommended intakes for individuals*. Retrieved from http://www.iom.edu/Activities/Nutrition/SummaryDRIs/~/media/Files/Activity%20Files/Nutrition/DRIs/New%20Material/5DRI%20Values%20SummaryTables%2014.pdf

References

National Center for Complementary and Alternative Medicine, National Institutes of Health (2011). *Backgrounder - Antioxidant Supplements for Health: An Introduction*. NCCAM Publication No. D450R. Retrieved from http://nccam.nih.gov/health/antioxidants/introduction.htm

National Heart, Lung and Blood Institute, National Institute of Health (n.d.). *What are High Blood Pressure and Prehypertension?* Retrieved from http://www.nhlbi.nih.gov/hbp/hbp/whathbp.htm

National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK] (2008, November). *Waist and waist measurement: tools for adults*. NIH Publication No. 04–5283. Retrieved from http://win.niddk.nih.gov/Publications/tools.htm

National Institutes of Health, National Institute of Arthritis and Musculoskeletal and Skin Diseases [NIAMS] National Resource Center (2009). *What is bone?* Retrieved from http://www.niams.nih.gov/Health_Info/Bone/Bone_Health/default.asp

National Institutes of Health, Office of Dietary Supplements [NIH, ODS] (2006). *Dietary supplement fact sheet: vitamin A and carotenoids*. Retrieved from http://ods.od.nih.gov/factsheets/vitamina/

National Institutes of Health, Office of Dietary Supplements (2007). *Dietary supplement fact sheet: iron*. Retrieved from http://ods.od.nih.gov/factsheets/Iron-HealthProfessional/

National Institutes of Health, Office of Dietary Supplements (2009). *Dietary supplement fact sheet: Folate*. Retrieved from http://ods.od.nih.gov/factsheets/Folate-HealthProfessional/

National Institutes of Health, Office of Dietary Supplements (2010). *Dietary supplement fact sheet: vitamin C*. Retrieved from http://ods.od.nih.gov/factsheets/VitaminC-HealthProfessional/

National Institutes of Health, Office of Dietary Supplements (2011a). *Dietary supplement fact sheet: calcium*. Retrieved from http://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/

National Institutes of Health, Office of Dietary Supplements (2011b). *Dietary supplement fact sheet: vitamin D*. Retrieved from http://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/

National Institute on Drug Abuse [NIDA] (2010, August). *NIDA infofacts: cigarettes and other tobacco products*. Retrieved from: http://www.drugabuse.gov/infofacts/tobacco.html

Nord, M., Coleman-Jensen A., Andrews M., and Carlson S. (2010). *Household food security in the United States, 2009*. Key statistics and graphs. U.S. Department of Agriculture, Economic Research Service Report No. ERR-108. Retrieved from http://www.ers.usda.gov/Briefing/FoodSecurity/stats_graphs.htm

Popkin B. M., Armstrong L. E., Bray G. M., Caballero, B., Frei, B. Willett, W. C. (2006). A new proposed guidance system for beverage consumption in the United States. *Am J Clin Nutr,* 83(3):529-42.

Risérus, U., Willett, W., and Hu, F. (2009). Dietary fats and prevention of type 2 diabetes. *Progress in Lipid Research*, 48(1), 44-51. doi:10.1016/j.plipres.2008.10.002

Romero-Corral A, Somers VK, Sierra-Johnson J, Korenfeld Y, Boarin S, Korinek J., ...Lopez-Jimenez F. (2010). Normal weight obesity: a risk factor for cardiometabolic dysregulation and cardiovascular mortality. *European Heart Journal,* 31(6), 737-46. doi: 10.1093/eurheartj/ehp487. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2838679/

Smith, E. L., Mechanick, J. I. (2008). Hydration and nutrition for the athlete. *Essential Sports Medicine,* 169-180. DOI: 10.1007/978-1-59745-414-8_12. Retrieved from http://www.springerlink.com/context/x24uj3q4252lxr48/

The National Center for Addiction and Substance Abuse at Columbia University (2010, September). *The Importance of Family Dinners V*. Retrieved from: http://www.casacolumbia.org

Troiano, R.P., Berrigan, D., Dodd, K. W., Masse, L. C.; Tilert, T., McDowell, M. (2008). Physical activity in the United States measured by accelerometer. *Medicine & Science in Sports & Exercise,* 40(1), 181-188. doi: 10.1249/mss.0b013e31815a51b3.

U.S. Department of Agriculture & U.S. Department of Health and Human Services (2010a, December). *Dietary Guidelines for Americans 2010*. (7th Edition). Retrieved from http://www.cnpp.usda.gov/DGAs2010-PolicyDocument.htm

U.S. Department of Agriculture & U.S. Department of Health and Human Services (2010b, June). *Report of the dietary guidelines advisory committee on the dietary guidelines for Americans, 2010*. Retrieved from http://www.cnpp.usda.gov/DGAs2010-DGACReport.htm

References

U.S. Department of Agriculture, Agricultural Research Service (2010c, September). *USDA National nutrient database for standard reference, Release 23*. Retrieved from http://www.ars.usda.gov/ba/bhnrc/ndl

U.S. Department of Agriculture (2011, July). *MyPlate*. Retrieved from http://www.choosemyplate.gov/

U.S. Department of Health and Human Services (2008, October). 2008 *Physical Activity Guidelines for Americans*. Retrieved from http://www.health.gov/paguidelines/pdf/paguide.pdf

U.S. Department of Health and Human Services (n.d). *Health facts: sodium and potassium*. Retrieved from http://www.csrees.usda.gov/nea/food/pdfs/hhs_facts_sodium.pdf

U.S. Food and Drug Administration (2003, September). Revealing trans fats. *FDA Consumer*. Retrieved from http://findarticles.com/p/articles/mi_m1370/is_5_37/ai_109906683/

U.S. Food and Drug Administration (2011a). *How to understand and use the nutrition facts label*. Retrieved from http://www.fda.gov/Food/LabelingNutrition/ConsumerInformation/ucm078889.htm

U.S. Food and Drug Administration (2011b). *Talking about trans fat: what you need to know*. Retrieved from http://www.fda.gov/food/resourcesforyou/consumers/ucm079609.htm

Wheeler, M. L., Daly, A., Evert A., Franz, M. J., Geil P., Holzmeister, L. A., Kulkarni K., Loghmani E., Ross, T. A., & Woolf, P. (2008, May). Choose Your Foods: Exchange Lists for Diabetes. *Journal of the American Dietetic Association,* 108(5). doi: 10.1016/j.jada.2008.02.002

World Health Organization (2008, December). Waist circumference and waist-hip ratio, report of a WHO Expert Consultation, Geneva, 8-11. Retrieved from http://whqlibdoc.who.int/publications/2011/9789241501491

Glossary

Added sugars – Sugars, syrups, and other caloric sweeteners that are added to foods during processing or preparation. Added sugars do not include naturally occurring sugars such as those in fruit or milk. Added sugars include: brown sugar, corn sweetener, corn syrup, dextrose, fructose, fruit juice concentrates, glucose, high-fructose corn syrup, honey, invert sugar, lactose, maltose, malt syrup, molasses, raw sugar, turbinado sugar, trehalose, and sucrose.

Alcohol – A dietary component that provides energy but no essential nutrients. 1 gram of alcohol provides 7 calories.

Amino Acids – Any of a large number of compounds found in living cells that contain carbon, oxygen, hydrogen, and nitrogen. Twenty of the naturally occurring amino acids connect to each other in chains to form the building blocks of proteins. *(See essential amino acids.)*

Antioxidant – A chemical compound or substance that inhibits oxidation. Certain vitamins such as vitamin E are antioxidants and may protect body cells from damage caused by the oxidative effects of free radicals.

Blood cholesterol – Cholesterol that travels in the blood as part of distinct particles containing both lipids and proteins (lipoproteins). Three major classes of lipoproteins are found in the serum of a fasting individual: low-density lipoprotein (LDL), high-density lipoprotein (HDL), and very-low-density lipoprotein (VLDL). Another lipoprotein class, intermediate-density lipoprotein (IDL), resides between VLDL and LDL; in clinical practice IDL is included in the LDL measurement. Elevated lipid levels in the blood is known as hyperlipidemia. *(See HDL cholesterol and LDL cholesterol.)*

Body mass index (BMI) – A measure of weight in kilograms (kg) relative to height in meters (m) squared. BMI is considered a reasonably reliable indicator of total body fat, which is related to the risk of disease and death. BMI status categories include underweight, healthy weight, overweight, and obese. Overweight and obese describe ranges of weight that are greater than what is considered healthy for a given height while underweight describes a weight that is lower than what is considered healthy. Because children and

adolescents are growing, their BMI is plotted on growth charts for sex and age. The percentile indicates the relative position of the child's BMI among children of the same sex and age.

Calorie – Unit of (heat) energy available from the metabolism of food that is required to sustain the various body functions, including metabolic processes and physical activity. Carbohydrate, fat, protein, and alcohol provide all of the energy supplied by foods and beverages.

Calcium – A mineral found mainly in the hard part of bones where it is stored. Calcium is constantly being used and replaced in the body. Calcium is essential for healthy bones, muscle contraction, heart action, nervous system maintenance, and normal blood clotting. Food sources of calcium include dairy foods, some leafy green vegetables such as broccoli and collards, canned salmon, clams, oysters, calcium-fortified foods, and tofu.

Calorie balance – The balance between calories consumed through eating and drinking and those expended through physical activity and metabolic processes.

Carbohydrates – One of the four dietary components that provides energy. 1 gram of carbohydrate provides 4 calories. The three main types of carbohydrates are sugars, starches, and fibers. *(See sugars, starches, and fiber.)*

Cardiovascular disease – Diseases of the heart and diseases of the blood vessel system (arteries, capillaries, veins).

Cholesterol – A natural sterol present in all animal tissues. Free cholesterol is a component of cell membranes and serves as a precursor for steroid hormones (estrogen, testosterone, aldosterone), and for bile acids. Humans are able to synthesize sufficient cholesterol to meet biologic requirements, and there is no evidence for a dietary requirement for cholesterol. *(See blood cholesterol and dietary cholesterol.)*

Complete proteins – Proteins containing all nine of essential amino acids. Animal foods are complete proteins; examples include fish, poultry, meat, eggs and milk products. Soybeans are the only plant product considered a complete protein.

Percent Daily Value – The Percent Daily Value appears on the Nutrition Facts label of packaged foods. It tells you if a serving of food is high or low in a nutrient.

Diabetes – A disorder of metabolism—the way the body uses digested food for growth and energy. In diabetes, the pancreas either produces little or no insulin (a hormone that helps glucose, the body's main source of fuel, get into cells), or the cells do not respond appropriately to the insulin that is produced. The three main types of diabetes are type 1, type 2, and gestational diabetes. About 90 to 95 percent of people with diabetes have type 2. This form of diabetes is most often associated with older age, obesity, family history of diabetes, previous history of gestational diabetes, physical inactivity, and certain ethnicities. About 80 percent of people with type 2 diabetes are overweight. *(See prediabetes.)*

Dietary cholesterol – Cholesterol found in foods of animal origin including meat, seafood, poultry, eggs, and dairy products. Biologically a liver is required to produce cholesterol, thus plant foods, such as grains, vegetables and fruits, and oils contain no dietary cholesterol.

Dietary supplement – A product taken orally that contains one or more ingredients that are not considered food but are intended to supplement one's diet. Dietary supplements are not regulated for safety and effectiveness in the United States.

Empty-calorie foods – Foods that contain solid fats and/or added sugars. These foods contribute calories to the diet but few or no nutrients.

Enrichment – The addition of specific nutrients (iron, thiamin, riboflavin, and niacin) to refined-grain products in order to replace losses of the nutrients that occur during processing.

Essential Amino Acids – Amino acids that cannot be synthesized in the cells of humans and must be consumed as part of the diet. There are eight essential amino acids.

Essential nutrient – A vitamin, mineral, fatty acid, or amino acid required for normal body functioning that either cannot be synthesized by the body at all, or cannot be synthesized in amounts adequate for good health, and thus must be obtained from a dietary source. Other food components, such as dietary fiber, while not essential, also are considered to be nutrients.

Fats – One of the four dietary components that provides energy. 1 gram of fat provides 9 calories. *(See solid fats, oils, monounsaturated fats, polyunsaturated fats, omega-3 fats, saturated fats, and trans fats.)*

Fiber – Nondigestible carbohydrates and lignin that are intrinsic and intact in plants. Fiber consists of dietary fiber (the fiber naturally occurring in foods) and functional fiber, which are isolated, nondigestible carbohydrates that have beneficial physiological effects in humans.

Food desert – Large geographic areas where healthy, affordable food is difficult to obtain, often due to grocery store shortages. Food deserts occur in both rural and urban areas and are most prevalent in low-socioeconomic minority communities. People living in food deserts may rely on fast food chains or convenience stores for food.

Food insecurity – The limited or uncertain availability of nutritionally adequate and safe foods or uncertain ability to acquire acceptable foods in socially acceptable ways.

Folate/Folic acid – One of the B vitamins that is a key factor in making nucleic acid (DNA and RNA). Lack of adequate folic acid during pregnancy increases the risk for the baby to have a birth defect involving the spinal cord and brain; a neural tube defect such as spina bifida (incomplete development of spinal cord) or anencephaly (absence of a major portion of the brain, skull and scalp). Folic acid is the synthetic version of folate that is added to cereals and other products.

Fortification – The addition of one or more essential nutrients to a food whether or not it is normally contained in the food. Fortification may be used for preventing or correcting a deficiency in the population or specific population groups; to restore naturally occurring nutrients lost during processing, storage, or handling; or to increase the nutrient level above that found in comparable food and to serve as a meaningful source of the specific nutrient.

HDL Cholesterol – The cholesterol in high-density lipoproteins also known as “good” cholesterol. A high level in the blood is thought to lower the risk of coronary artery disease.

Hydrogenation – A chemical reaction that adds hydrogen atoms across a double bonded carbon. Oils are frequently hydrogenated to increase shelf-life. Hydrogenation creates some trans-fat molecules, which have been determined to be dangerous and have a negative effect on cardiovascular health.

Hypertension – A condition, also known as high blood pressure in which blood pressure is >140/90 mm HG and remains elevated over time. Hypertension makes the heart work too hard, and the high force of the blood flow can harm arteries and organs such as the heart, kidneys, brain, and eyes. Uncontrolled hypertension can lead to heart attacks, heart failure, kidney disease, stroke, and blindness. *(See prehypertension.)*

Incomplete proteins – Proteins that lack one or more of the nine essential amino acids. Incomplete proteins are non-animal products. Examples of incomplete proteins include beans, peas, nuts, seeds and grains. Vegetables also contain small amounts of incomplete proteins. Incomplete plant proteins can be combined to form a complete protein if they provide all of the essential amino acids. Examples of plant protein combinations that make a complete protein include rice and beans or corn and beans.

Iron – A mineral that allows red blood cells to transport oxygen and carbon dioxide throughout the body. Iron also plays an important role in enzymatic reactions, brain development and the immune system. *(See iron deficiency and iron-deficiency anemia.)*

Iron-deficiency – A condition resulting from too little iron in the body. It is usually due to poor dietary intake, poor absorption, rapid growth or major blood loss. During the initial stages of iron-deficiency, there may be no symptoms. More advanced iron-deficiency can lead to iron-deficiency anemia and physical symptoms.

Iron-deficiency anemia – The advanced stage of iron deficiency. Symptoms of iron-deficiency anemia include lack of energy, decreased cognition, inflamed tongue and difficulty breathing.

LDL cholesterol – The cholesterol in low-density lipoproteins also known as “bad” cholesterol. A high blood level of LDL cholesterol is related to various pathogenic conditions.

Mindful eating – Eating principle that focuses on a conscious nonjudgmental awareness of food choices and attention to hunger and satiety cues.

Monounsaturated fats – Monounsaturated fatty acids (MUFAs) have one double bond. Plant sources that are rich in MUFAs include nuts and vegetable oils that are liquid at room temperature. Examples include canola oil, olive oil, and high oleic safflower and sunflower oils.

Naturally-present sugars – Sugars that occur naturally in fruits, vegetables, milk and milk products. Naturally-present sugars are in nutrient-dense foods that supply vitamins, minerals and other substances with relatively few calories. *(See added sugars).*

Nutrient-dense foods – Nutrient-dense foods and beverages provide vitamins, minerals, and other substances that may have positive health effects with relatively few calories. The term "nutrient dense" indicates the nutrients and other beneficial substances in a food have not been "diluted" by the addition of calories from added solid fats, added sugars, or added refined starches, or by the solid fats naturally present in the food. Nutrient-dense foods and beverages are lean or low in solid fats, and minimize or exclude added solid fats, sugars, starches, and sodium. Ideally, they also are in forms that retain naturally occurring components, such as dietary fiber. All vegetables, fruits, whole grains, seafood, eggs, beans and peas, unsalted nuts and seeds, fat-free and low-fat milk and milk products, and lean meats and poultry — when prepared without solid fats or added sugars — are nutrient-dense foods.

Oils – Fats that are liquid at room temperature. Oils come from many different plants and from seafood. Some common oils include canola, corn, olive, peanut, safflower, soybean, and sunflower oils. A number of foods are naturally high in oils such as nuts, olives, some fish, and avocados. Most oils are high in monounsaturated or polyunsaturated fats and low in saturated fats. A few plant oils, including coconut oil and palm kernel oil are high in saturated fats and for nutritional purposes should be considered solid fats. Hydrogenated oils that contain trans fats also should be considered solid fats for nutritional purposes. *(See Fats, Monounsaturated fats, Omega-3 fats and Polyunsaturated fats).*

Omega-3 fats – Also called n-3 fatty acids. Alpha-linolenic acid is an n-3 fatty acid that is required because it is not synthesized by humans and therefore is considered essential in the diet. It is obtained from plant sources including soybean oil, canola oil, walnuts, and flaxseed. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are long chain n-3 fatty acids that are contained in fish and shellfish.

Osteoporosis – A bone disease characterized by decrease in bone mass and density resulting in a predisposition to fractures and bone deformities. It occurs most commonly in women after menopause as

a result of estrogen deficiency. Calcium supplementation and weight-bearing exercise are used to treat and prevent osteoporosis.

Physical activity – Any body movement that works your muscles and uses more energy than you use when you're resting. Walking, running, dancing, swimming, yoga, and gardening are examples of physical activity.

Plaque – A substance made up of fat, cholesterol, calcium, and other substances found in the blood. Over time plaque hardens and narrows the arteries. This limits the flow of oxygen-rich blood to the organs and other parts of the body. Atherosclerosis is a disease in which plaque builds up inside your arteries.

Portion size – The amount of a food served or consumed in one eating occasion. A portion is not a standardized amount, and the amount considered to be a portion is subjective and varies. *(See serving size.)*

Potassium – A mineral that is important for normal cell function, the nervous system and the heart. Potassium helps to lower blood pressure, reduce risk of kidney stones and decrease bone loss. Food sources of potassium include dairy foods, vegetables like potatoes, tomatoes, carrots, spinach and fruits such as bananas and oranges.

Prediabetes – Also called impaired fasting glucose or impaired glucose tolerance. A state in which blood glucose levels are higher than normal but not high enough to be called diabetes.

Prehypertension – Blood pressure that is higher than normal but not high enough to be defined as hypertension. It is defined as blood pressures between 120/80 mm Hg and 139/89 mm Hg.

Polyunsaturated fats – Also called n-6 fatty acids. Polyunsaturated fatty acids (PUFAs) have two or more double bonds. Linoleic acid, one of the n-6 fatty acids, is essential but cannot be synthesized by humans. Primary sources are liquid vegetable oils, including soybean oil, corn oil, and safflower oil.

Proteins – One of the four dietary components that provides energy. 1 gram of protein provides 4 calories. Proteins are composed of amino acids, nine of which cannot be made by the body so they must be obtained from the diet. The quality of a source of dietary protein depends on its ability to provide the nitrogen and amino acid requirements that are necessary for the body's growth, maintenance,

and repair. Food sources of protein include fish, poultry, lean beef and pork, eggs, dairy products, dried beans, nuts and nut butters. *(See complete proteins and incomplete proteins.)*

Refined grains – Grains and grain products missing the bran, germ, and/or endosperm; any grain product that is not a whole grain. Many refined grains are low in fiber and enriched with thiamin, riboflavin, niacin, and iron, and fortified with folic acid as required by U.S. regulations. *(See enrichment.)*

Rickets – A deficiency disease resulting from a lack of vitamin D or calcium and insufficient exposure to sunlight. Rickets occurs in children and is characterized by defective bone growth such as short stature, bowed legs or easily broken bones.

Saturated fats – Saturated fatty acids have no double bonds. Examples include the fatty acids found in animal products such as meat, milk and milk products, hydrogenated shortening, and coconut or palm oils. In general foods with relatively high amounts of saturated fatty acids are solid at room temperature.

Trans fats – Unsaturated fatty acids that contain one or more isolated double bonds in a trans configuration produced by chemical hydrogenation. Sources of trans fatty acids include hydrogenated/partially hydrogenated vegetable oils that are used to make shortening and commercially prepared baked goods, snack foods, fried foods, and margarine. Trans fatty acids also are present in foods that come from ruminant animals (e.g., cattle and sheep). Such foods include dairy products, beef, and lamb.

Seafood – Marine animals that live in the sea and in freshwater lakes and rivers. Seafood includes fish, such as salmon, tuna, trout, and tilapia, and shellfish, such as shrimp, crab, and oysters.

Serving size – A standardized amount of a food such as a cup or an ounce used in providing information about a food within a food group, such as in dietary guidance. Serving size on the Nutrition Facts label is determined based on the Reference Amounts.

Sodium – A mineral that plays an important role in nerve function, muscle contraction and fluid balance in the body. Too much or too little sodium can cause cells to malfunction. Too much sodium can lead to high blood pressure and increased risk for heart disease and stroke.

Solid fats – Fats that are usually not liquid at room temperature. Solid fats are found in most animal foods but also can be made from vegetable oils through hydrogenation. Some common solid fats include: butter, beef fat (tallow, suet), chicken fat, pork fat (lard), stick margarine, coconut oil, palm oil, and shortening. Foods high in solid fats include: full-fat (regular) cheese, cream, whole milk, ice cream, well-marbled cuts of meats, regular ground beef, bacon, sausages, poultry skin, and many baked goods (such as cookies, crackers, donuts, pastries, and croissants). Solid fats contain more saturated fatty acids and/or trans fatty acids, and less monounsaturated or polyunsaturated fatty acids than do most oils, which are liquid at room temperature.

Starches – Many glucose units linked together into long chains. Examples of foods containing starch include grains (e.g., brown rice, oats, wheat, barley, corn), beans and peas (e.g., kidney beans, garbanzo beans, lentils, split peas), and tubers (e.g., potatoes, carrots). Refined starches are added to foods during food processing or cooking as thickeners and stabilizers. Corn starch is an example of a refined starch.

Sugars – A simple carbohydrate composed of one unit (a monosaccharide such as glucose or fructose) or two joined units (a disaccharide such as lactose or sucrose). Sugars include those occurring naturally in foods, those added to foods during processing and preparation, and those consumed separately.

Triglycerides – The major form of fat stored by the body. A triglyceride consists of three molecules of fatty acid combined with a glycerol molecule. Triglycerides serve as the backbone of many types of lipids (fats). Triglycerides come from the food we eat as well as from being produced by the body.

Vitamin A – A fat-soluble vitamin important for normal vision, tissue growth, and healthy skin. It is found in fish-liver oils, milk, green leafy vegetables, and red, orange, and yellow vegetables and fruits. A deficiency of vitamin A in humans causes poor vision at night and damage to the skin and mucous membranes.

Vitamin D – A fat-soluble vitamin occurring in several forms, especially vitamin D_2 or vitamin D_3. Vitamin D is necessary for normal bone growth. Vitamin D is found in milk, fish, and eggs and can be produced in the skin on exposure to sunlight. A deficiency of vitamin D in the diet causes rickets in children.

Vitamin C – A water-soluble vitamin that is important for healthy skin, teeth, bones, and blood vessels. It is found in citrus fruits, tomatoes, potatoes, and green leafy vegetables. A deficiency of vitamin C in the diet causes scurvy.

Waist circumference – A measurement of the girth of the waist. Fat around the waist increases the risk of obesity-related health problems. Women with a waist measurement of more than 35 inches or men with a waist measurement of more than 40 inches have a higher risk of developing obesity-related health problems, such as diabetes, high blood pressure, and heart disease.

Water – A clear, colorless, tasteless, odorless liquid that is essential for plant and animal life. In the human body water helps to lubricate joints and organs, regulate temperature, and remove waste products. Water also makes up major bodily fluids such as blood, saliva, swear, urine, and amniotic fluid.

Whole Grains – Grains and grain products made from the entire grain seed, usually called the kernel, which consists of the bran, germ, and endosperm. If the kernel has been cracked, crushed, or flaked, it must retain nearly the same relative proportions of bran, germ, and endosperm as the original grain in order to be called whole grain.

Basic Nutrition Module Answer Key

Part 1 Test

1. TRUE
2. FALSE
3. TRUE
4. e
5. b
6. a
7. e

Part 2 Test

1. d
2. FALSE
3. ☐ Age
   ☐ Medical conditions
   ☐ Gender
   ☐ Weight
4. b
5. d
6. TRUE
7. FALSE
8. FALSE

Answer Key

Part 3 Test

1. ☐ Energy drinks
   ☐ Apple pie
   ☐ Fruit punch
   ☐ Ice cream
2. FALSE
3. TRUE
4. TRUE
5. ☐ Shortening
   ☐ Partially-hydrogenated vegetable oil
   ☐ Whole milk
6. TRUE
7. TRUE
8. TRUE
9. ☐ Egg
   ☐ Beef
10. TRUE
11. TRUE
12. FALSE

Part 4 Test

1. TRUE
2. FALSE
3. TRUE
4. d
5. b
6. d
7. ☐ Spinach
   ☐ Fortified breakfast cereal
   ☐ Black-eyed peas
   ☐ Asparagus
8. ☐ Yogurt
   ☐ Canned salmon with edible bones
   ☐ Mozzarella cheese
   ☐ Calcium-fortified orange juice
   ☐ Milk
9. c
10. c

Part 5 Test

1. ☐ Regular soda
   ☐ Doughnut
   ☐ Candy
2. c
3. d
4. c
5. a
6. b
7. ☐ Turning off your cell phone during dinner.
   ☐ Taking time to eat meals slowly.
8. c

Part 6 Test

1. TRUE
2. TRUE
3. FALSE
4. FALSE
5. TRUE
6. TRUE
7. TRUE
8. d
9. ☐ High blood pressure
   ☐ High cholesterol and triglycerides
   ☐ High blood glucose
   ☐ Family history of chronic disease
   ☐ Tobacco use

Nutrition Services Section
Nutrition Education / Clinic Services Unit
Texas Department of State Health Services

Stock No. 13-33
July 2012

A companion publication, Basic Nutrition Module Workbook,
stock number 13-33-1, is also available from DSHS.