

# Nutrition 101

A Taste of Food and Fitness  
4th Edition





# **Nutrition 101: A Taste of Food and Fitness 4th Edition**

## **Participant's Workbook**

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**Key Area 1: Nutrition**

**Professional Standards Code: 1200 & 1300**

**2018**

# Institute of Child Nutrition

## The University of Mississippi

The Institute of Child Nutrition was authorized by Congress in 1989 and established in 1990 at the University of Mississippi in Oxford and is operated in collaboration with The University of Southern Mississippi in Hattiesburg. The Institute operates under a grant agreement with the United States Department of Agriculture, Food and Nutrition Service.

### **PURPOSE**

Improve the operation of child nutrition programs through research, education and training, and information dissemination.

### **VISION**

Lead the nation in providing research, education, and resources to promote excellence in child nutrition programs.

### **MISSION**

Provide relevant research-based information and services that advance the continuous improvement of child nutrition programs.

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## Overview of Nutrition 101: A Taste of Food and Fitness

Welcome to the Institute of Child Nutrition's (ICN) *Nutrition 101: A Taste of Food and Fitness, 4th Edition*. This training provides a basic overview of nutrition information. The information can be used at home and at work in the school nutrition program.

ICN designed this training so you, the participant, is actively involved in learning nutritional concepts to apply in your school nutrition programs. School nutrition staff are responsible for preparing and serving students healthful and safe meals. This training provides tools and ideas school nutrition managers and staff can use to meet this goal.

Each lesson includes the following:

- Activities
- Physical Activity Boosters
- Handouts used in the lesson
  - **Cafeteria Connection** – informational pages that create a connection between the basics of good nutrition covered in the lesson and how school nutrition programs can incorporate good nutrition practices every day.
  - **Nutrition Nuggets** – additional information to support the content of the lesson.
  - **24-Hour Food Recall and 24-Hour Physical Activity Recall** – give participants insight to what they eat and the amount of physical activity they participate in a certain time period. The trainer does not review these.
  - **Personal Discovery Assessment** – assessment activity that gives participants an opportunity to learn more about personal eating and activity habits; the trainer does not review this.
  - **Resource** – organizations and contacts for more information on the lesson topic; these pages are identified as Resource in the title of the handout.

# Professional Standards

## Nutrition Education – 1200

Employee will be able to utilize resources to prepare and integrate age/grade appropriate nutrition education curriculum with school nutrition program.

1210 – Nutrition Activities

## General Nutrition – 1300

Employee will be able to understand the *Dietary Guidelines for Americans*, USDA food guidance concepts, and general nutrition principles.

1310 – *Dietary Guidelines for Americans*, MyPlate and school nutrition

1320 – General Nutrition

## Key Area 1: Nutrition



## Training Objectives

*Nutrition 101: A Taste of Food and Fitness* provides a basic overview of nutrition. Each lesson will incorporate a variety of learning activities to engage you on a personal level. The lessons will also describe how school nutrition programs contribute to students' health and ability to learn.

At the end of the training, participants will be able to accomplish the following objectives:

### Lesson 1: Nutrition is Important to You!

- Identify a personal interest in health and nutrition.
- Identify roles nutrition plays in promoting health throughout the body.
- Describe how the School Breakfast Program contributes to students' health and school performance.

### Lesson 2: Tools for Guiding Food Choices

- Recognize the *Dietary Guidelines for Americans* (DGAs) and USDA's MyPlate.
- Identify information on the Nutrition Facts label that is useful in making food choices consistent with the dietary advice of the *Dietary Guidelines for Americans* and MyPlate.
- Describe ways the school meal programs may reflect aspects of the *Dietary Guidelines for Americans* that contribute to students' health and ability to learn.

### Lesson 3: The Energy Nutrients

- Identify essential energy nutrients, macronutrients, the major function each plays in a healthy body, and food sources of each.
- Identify food sources of carbohydrates and how the body uses them.
- Describe how the different types of fats and oils influence health and chronic disease risks.
- Describe how school meals are planned to balance nutrients and contribute to students' health.

## Lesson 4: Vitamins and Minerals

- Identify essential vitamins and minerals, micronutrients, the major function each plays in a healthy body and food sources of each.
- List the fat-soluble vitamins.
- List the water-soluble vitamins.
- Identify the major and trace minerals.
- Describe how iron intake influences a student's ability to learn.

## Lesson 5: Alternate Eating Patterns

- Explain how school nutrition programs can accommodate students who prefer a vegetarian lifestyle.
- Identify the differences between the four most common types of vegetarian eating patterns.
- Describe how plant-based foods can provide complete proteins.
- Describe the difference between Type 1 and Type 2 diabetes.
- Distinguish between food allergies, food intolerances, and celiac disease.
- Demonstrate reading food allergens on a food label.

## Lesson 6: Putting it All Together

- Identify factors that influence food choices.
- Describe how school nutrition professionals can incorporate students' taste preferences into daily meals that will contribute to students' health.
- State ways to enhance the flavor of food without adding salt, sugar, or fat.

## Lesson 7: Nutrition Issues in the Media

- Identify common signs of misleading nutrition information in the media.
- Determine ways school nutrition programs can be a source of credible nutrition information for children and adults accessing the programs.



A Taste of Food and Fitness

**Lesson 1:**  
**Nutrition is Important to You!**







## Interesting Facts About Chronic Diseases

Health Condition	Facts
Overweight and Obesity	<ul style="list-style-type: none"> <li>In 2009-2012, 65% of adult females and 73% of adult males were overweight or obese.</li> <li>In 2009-2012, nearly one in three youth ages 2 to 19 years were overweight or obese.</li> </ul>
Cardiovascular Disease (CVD) and Risk Factors:  Coronary Heart Disease  Stroke  Hypertension  High Total Blood Cholesterol	<ul style="list-style-type: none"> <li>In 2010, CVD affected about 84 million men and women ages 20 years and older (35% of the population).</li> <li>In 2007-2010, about 50% of adults who were normal weight, and nearly 3/4 of those who were overweight or obese, had at least one cardiometabolic risk factor.</li> <li>In 2009-2010, almost 56% of adults ages 18 years and older had either prehypertension (27%) or hypertension (29%).</li> <li>In 2009-2012, rates of hypertension among adults were highest in African Americans (41%) and in adults ages 65 years and older (69%).</li> <li>In 2009-2012, 10% of children ages 8 to 17 years had either borderline hypertension (8%) or hypertension (2%).</li> <li>In 2009-2012, 100 million adults ages 20 years or older (53%) had total cholesterol levels <math>\geq 200</math> mg/dL; 31 million had levels <math>\geq 240</math> mg/dL.</li> <li>In 2011-2012, 8% of children ages 8 to 17 years had total cholesterol levels <math>\geq 200</math> mg/dL.</li> </ul>
Diabetes	<ul style="list-style-type: none"> <li>In 2012, the prevalence of diabetes (type 1 and type 2) was 14% for men and 11% for women ages 20 years and older (more than 90% of total diabetes in adults is type 2.)</li> <li>Among children with type 2 diabetes, about 80% were obese.</li> </ul>
Cancer	<ul style="list-style-type: none"> <li>Breast cancer is the third leading cause of cancer death in the United States.</li> <li>In 2012, an estimated 3 million women had a history of breast cancer.</li> <li>Colorectal cancer is the second leading cause of cancer death in the United States.</li> <li>In 2012, an estimated 1.2 million adult men and women had a history of colorectal cancer.</li> </ul>

Source: *Dietary Guidelines for Americans 2015-2020*. <http://health.gov/dietaryguidelines/2015/guidelines/>

## 24-Hour Physical Activity Recall

**Instructions:** Record all the physical activities completed in the last 24 hours. This may include walking, climbing stairs, shopping, exercising at a gym, yard work, walking the dog, etc.

Activity	Duration	Type Heavy, Moderate or Light Aerobic Stretching, Yoga, Light Movement

Have you participated in an aerobic activity in the last 24 hours?



## Healthy Eating and Healthy Weight

Balance is the key to enjoyable eating and maintaining a healthy weight. Tip the scales in your favor by following the ideas below.

### **Balance calories eaten with daily activity.**

Calories do count. To keep a healthy weight, balance the calories from foods with the calories burned in daily work and play. If you want to lose weight, do it in a healthy way. Each day, gradually decrease calories eaten, and increase calories burned. For example, eating 100 fewer calories a day for one year can result in a 10-pound weight loss. If you burn an extra 100 calories a day for a year through increased activity, you could lose an additional 10 pounds.

Here is a simple example. If you drink a regular soda daily, choose the 12-ounce can instead of the 20-ounce bottle. The smaller portion will reduce calories by about 100 per day. Walk briskly for 15 minutes after work on the school track and for 15 minutes after dinner in your neighborhood. It all adds up, or rather, subtracts from your weight. These two simple changes could result in a 20-pound weight loss in a year! Then try to reduce the number of days you drink soda in a week.

### **Balance meals throughout the day.**

Regularly spaced meals throughout the day will keep your body supplied with the energy it needs. Some people find three meals and a snack, evenly spaced, are just right to fuel work and play. Others find three small meals and three small snacks work better to keep hunger at bay. The key is to watch portion sizes and avoid overeating. Think of your stomach as having a gauge that indicates fullness from 0 (hungry) to 5 (stuffed). Let the fullness of your stomach, not the emptiness of your plate, help you decide when you have eaten enough. Eating slowly also helps your brain sense you are full.

### **Balance choices among food groups.**

Take a second look at your food habits. Are you leaving any food groups out of your daily food choices? Eat foods from different food groups during meals and snacks to have enough of each group. Most people need more fruits, vegetables, low-fat milk and milk products, and whole grains. Come up with interesting snack ideas featuring these foods.

### **Balance choices within food groups.**

How many different foods do you eat in a day? In a week? In a month? Try to expand the number of fruit and vegetable choices eaten over the course of a week. Try to have a different color, such as orange, red, or dark green, at every meal or snack. Enjoy plant sources of protein as well as meats. Select whole grains such as brown rice and whole wheat bread. Select different choices from the milk group, like milk, cheese, and yogurt. Be adventurous. Try new choices and enjoy the great flavors you discover.

**For delicious, nutritious meals**

- Pick plenty of produce. The recommended amount of fruits and vegetables depend on your age, sex, and physical activity.
- Grab wholesome grains. The amount of grains you need depends on your age, sex, and physical activity. Make at least half of your grains whole grain choices.
- Drink calcium-rich milk. The amount needed depends on the age of the person. The recommended amount for children 2 - 3 years old is 2 cups and children 4 - 8 years old is 2 ½ cups. Adults should choose 3 servings of fat-free or low-fat dairy products each day.
- Look for calcium-rich, non-dairy food. Some calcium-rich foods are white beans, canned salmon and sardines with bones, dried figs, Bok choy, kale, black-eyed peas, almonds, turnip greens, fortified orange juice, and soymilk to name a few.
- Eat a variety of protein foods. The amount of protein foods you need depends on your age, sex, and physical activity.

**Try to**

- Choose lean meats.
- Select 8 ounces of seafood per week. Young children need less, depending on their age and calorie needs.
- Include legumes (dried beans and peas) several times a week.
- Nibble on unsalted nuts and seeds. Grab a small handful a few times a week. Look for unsweetened, raw, or dry roasted.

Choose these foods each day to fill you up without filling you out. When more of your plate is full of fruits, vegetables, and whole grains, there is less room for fatty foods, salty snacks, and sweets.

Check out **choosemyplate.gov**  
for a table on recommended servings and  
to find more about healthy lifestyle habits.

Sources: <https://www.choosemyplate.gov>/<https://health.gov/dietaryguidelines/2015/guidelines/>



## 24-Hour Food Recall

**Instructions:** On the following chart, list everything you have eaten in the last 24 hours, including water, gum, hard candies, coffee, and tea. Then, record everything you consumed on a **weekend** day (Saturday or Sunday).

Food/Beverage Item	Serving Size	Time Consumed	Where





## Cafeteria Connection: Breakfast for Better Health

Breakfast has been called the most important meal of the day. While no meal can claim that ranking, eating breakfast is one nutrition habit that pays big health rewards.

### Students Who Eat Breakfast Are

- Less likely to be overweight
- More likely to have higher nutrient intakes

The School Breakfast Program provides students of all ages with a nutritious meal to break the fast. Students' health and school scores both improve when students eat school breakfast.

### Students Who Eat School Breakfast Have

- Better test scores
- Fewer behavioral problem in class
- Better attention span
- More days at school on time
- More days in school
- Fewer missed days due to illness
- Fewer visits to the nurse's office
- Better nutrition through a balanced meal

School breakfast provides one-fourth of the nutrition a student needs each day. Many times, school breakfast is more nutritious than the foods a student may select from home or on the way to school. Often students buy snack-type items from a convenience store. School breakfast provides a balance of calories and important nutrients, including calcium, riboflavin, phosphorus, and magnesium. Many tools are available to help schools start, promote, and extend school breakfast.

For more information on school breakfast, check out the resources at the following websites.

<a href="http://icn.ms/2zKdmHO">http://icn.ms/2zKdmHO</a>	Expanding School Breakfast Talking Points
<a href="http://icn.ms/2y12LG8">http://icn.ms/2y12LG8</a>	USDA: School Breakfast Program (SBP)
<a href="http://icn.ms/2xZU6c0">http://icn.ms/2xZU6c0</a>	FRAC: School Breakfast Program
<a href="http://icn.ms/2yDZ9i1">http://icn.ms/2yDZ9i1</a>	American Dairy Assoc.: Why School Breakfast Matters
<a href="http://icn.ms/2y04AZ3">http://icn.ms/2y04AZ3</a>	NCSL: A Guide to the School Breakfast Program

## Resource: Nutrition and Health Information

Do you want to start a walking program or a healthy weight plan? The following organizations can provide general information about a disease or health condition. Many of these organizations may have local chapters in communities nationwide. Check the websites or your local phone directory for regional offices. Remember to check with a state licensed healthcare professional if you have any health concerns.

American Cancer Society  
[www.cancer.org](http://www.cancer.org)

American Dental Association  
211 East Chicago Ave.  
Chicago, IL 60611-2678  
[www.ada.org](http://www.ada.org)

American Diabetes Association  
ATTN: National Call Center  
1701 North Beauregard St.  
Alexandria, VA 22311  
[www.diabetes.org](http://www.diabetes.org)

Academy of Nutrition and Dietetics  
120 South Riverside Plz., Suite 2000  
Chicago, IL 60606  
[www.eatright.org](http://www.eatright.org)

American Heart Association and American  
Stroke Association National Center  
7272 Greenville Ave.  
Dallas, TX 75231  
<http://www.heart.org/HEARTORG/>

March of Dimes  
1275 Mamaroneck Ave.  
White Plains, NY 10605  
<http://www.marchofdimes.org>

National Osteoporosis Foundation  
251 18th Street South, Suite 630  
Arlington, VA 22202  
[www.nof.org](http://www.nof.org)





A Taste of Food and Fitness

**Lesson 2:**  
**Tools for Guiding Food Choices**





## DGAs Key Recommendations

Take action on the *Dietary Guidelines for Americans* by making changes in these areas. Choose steps that work for you, and start today using these key recommendations.

### Follow a healthy eating pattern

- Choose a variety of vegetables from all of the subgroups
- Enjoy whole fruit
- Include whole grains making at least half whole grains
- Shift to fat-free or low-fat dairy products
- Enjoy a variety of protein foods
- Consume healthy oils instead of saturated fats

### A healthy eating pattern limits

- Saturated fats and *trans* fats, added sugars, and sodium
- Consume less than 10 percent of calories per day from added sugars
- Consume less than 10 percent of calories per day from saturated fats
- Consume less than 2,300 milligrams (mg) per day of sodium

Source: <https://health.gov/dietaryguidelines/2015/guidelines/chapter-1/key-recommendations/>





## Calculating Fat Content and Percentage

**Instructions:** Using the Nutrition Facts label on the next page, calculate the fat calories and percentage of fat content for this food product. The formulas are given. Note: 1 gram of fat contains 9 calories.

### 1. Calculate fat calories and percentage of fat content

Multiply the grams of fat by 9 = the number of fat calories.

Divide the number of fat calories by the total number of calories in the food item = % of fat content.

$$9 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ number of fat from calories}$$

$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \% \text{ of fat content}$$

### 2. Calculate saturated fat calories and percentage of saturated fat content

Multiply the grams of saturated fat by 9 = the number of saturated fat calories in the food item.

Divide the number of saturated fat calories in the food item by the total number of calories in the food item = % of saturated fat.

$$\underline{\hspace{2cm}} \times 9 = \underline{\hspace{2cm}} \text{ number of saturated fat from calories}$$

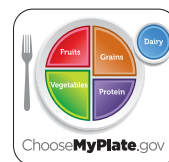
$$\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \% \text{ of saturated fat}$$

Nutrition Facts			
Serving Size 1 package			
Servings Per Container 1			
Amount Per Serving			
Calories 240		Calories from Fat 140	
% Daily Value*			
Total Fat 16g		24%	
Saturated Fat 2g		11%	
Trans Fat 0g			
Cholesterol 0mg		0%	
Sodium 250mg		10%	
Potassium 520mg		15%	
Total Carbohydrate 23g		8%	
Dietary Fiber 2g		7%	
Sugars 1g			
Protein 3g			
Vitamin A 0%		•	Vitamin C 15%
Calcium 0%		•	Iron 4%
Vitamin E 8%		•	Thiamin 6%
Niacin 8%		•	Vitamin B6 15%
Magnesium 6%		•	Zinc 2%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300g	300mg
Sodium	Less than	2,400mg	2,400mg
Potassium		3,500mg	3,500mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9	•	Carbohydrate 4	• Protein 4

**10**  
**tips**  
Nutrition  
Education Series

## Salt and Sodium

**10 tips** to help you cut back



**It's clear that Americans have a taste for salt**, but salt plays a role in high blood pressure. Everyone, including kids, should reduce their sodium intake to less than 2,300 milligrams of sodium a day (about 1 teaspoon of salt). Adults age 51 and older, African Americans of any age, and individuals with high blood pressure, diabetes, or chronic kidney disease should further reduce their sodium intake to 1,500 mg a day.

### 1 Think fresh

Most of the sodium Americans eat is found in processed foods. Eat highly processed foods less often and in smaller portions—especially cheesy foods, such as pizza; cured meats, such as bacon, sausage, hot dogs, and deli/ luncheon meats; and ready-to-eat foods, like canned chili, ravioli, and soups. Fresh foods are generally lower in sodium.

### 2 Enjoy home-prepared foods

Cook more often at home—where you are in control of what's in your food. Preparing your own foods allows you to limit the amount of salt in them.

### 3 Fill up on veggies and fruits—they are naturally low in sodium

Eat plenty of vegetables and fruits—fresh or frozen. Eat a vegetable or fruit at every meal.

### 4 Choose dairy and protein foods that are lower in sodium

Choose more fat-free or low-fat milk and yogurt in place of cheese, which is higher in sodium. Choose fresh beef, pork, poultry, and seafood, rather than those with salt added. Deli or luncheon meats, sausages, and canned products like corned beef are higher in sodium. Choose unsalted nuts and seeds.

### 5 Adjust your taste buds

Cut back on salt little by little—and pay attention to the natural tastes of various foods. Your taste for salt will lessen over time.

### 6 Skip the salt

Skip adding salt when cooking. Keep salt off the kitchen counter and the dinner table. Use spices, herbs, garlic, vinegar, or lemon juice to season foods or use no-salt seasoning mixes. Try black or red pepper, basil, curry, ginger, or rosemary.

### 7 Read the label

Read the Nutrition Facts label and the ingredients statement to find packaged and canned foods lower in sodium. Look for foods labeled “low sodium,” “reduced sodium,” or “no salt added.”

### 8 Ask for low-sodium foods when you eat out

Restaurants may prepare lower sodium foods at your request and will serve sauces and salad dressings on the side so you can use less.

### 9 Pay attention to condiments

Foods like soy sauce, ketchup, pickles, olives, salad dressings, and seasoning packets are high in sodium. Choose low-sodium soy sauce and ketchup. Have a carrot or celery stick instead of olives or pickles. Use only a sprinkling of flavoring packets instead of the entire packet.

### 10 Boost your potassium intake

Choose foods with potassium, which may help to lower your blood pressure. Potassium is found in vegetables and fruits, such as potatoes, beet greens, tomato juice and sauce, sweet potatoes, beans (white, lima, kidney), and bananas. Other sources of potassium include yogurt, clams, halibut, orange juice, and milk.

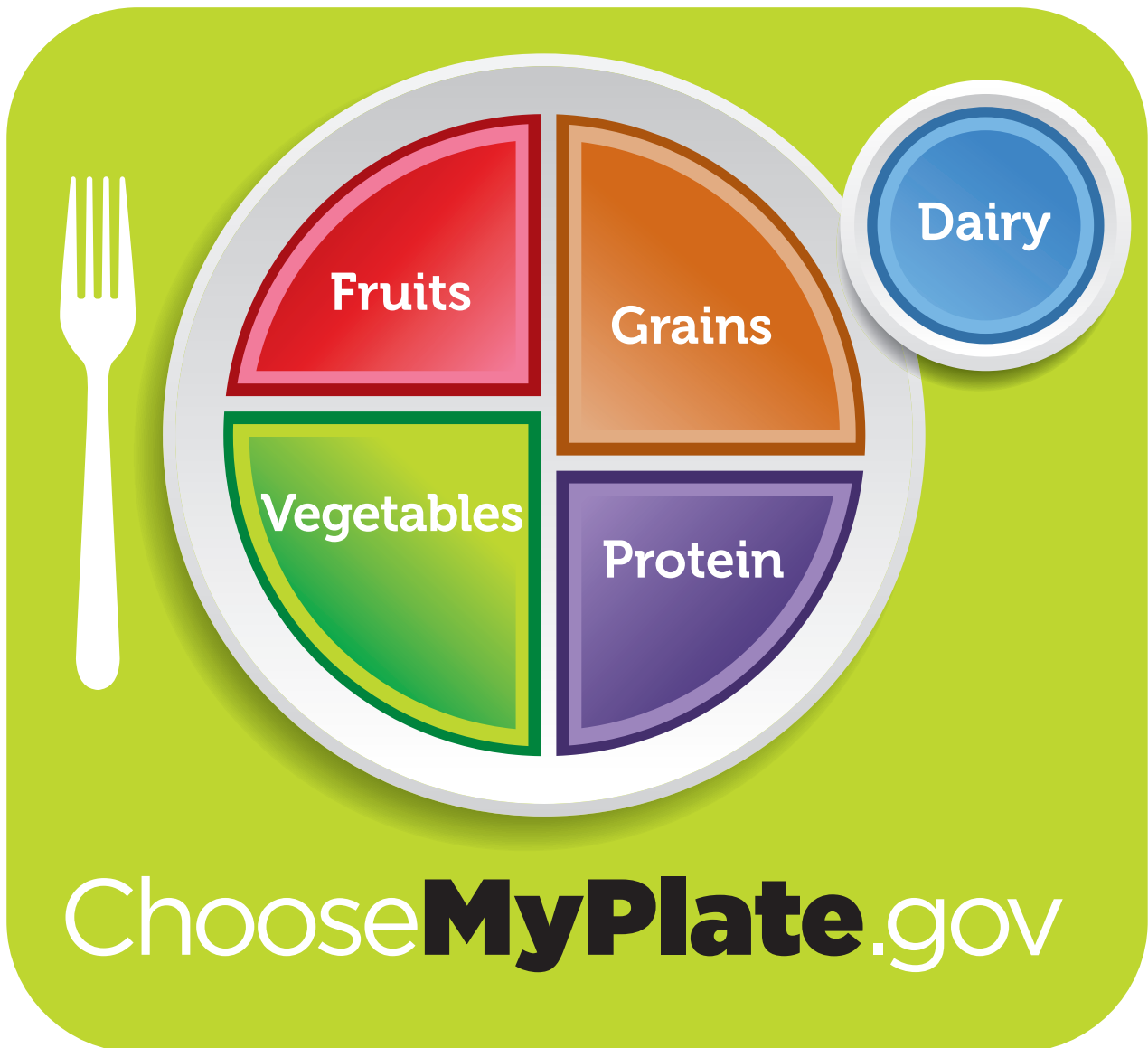


Go to [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov) for more information.

Center for Nutrition Policy and Promotion  
DG Tip Sheet No. 14 June 2011

Adapted from: <http://www.med.umich.edu/1libr/Nutrition/MyPlate/DGTipsheet14SaltAndSodium.pdf>

## MyPlate



Source: [http://www.choosemyplate.gov/global\\_nav/media\\_resources.html](http://www.choosemyplate.gov/global_nav/media_resources.html)





## Identifying Whole Grain Products

Words you may see on packages	What they mean
<ul style="list-style-type: none"> <li>• whole grain [name of grain]</li> <li>• whole wheat</li> <li>• whole [other grain]</li> <li>• stoneground whole [grain]</li> <li>• brown rice</li> <li>• oats, oatmeal (including old-fashioned oatmeal, instant oatmeal)</li> <li>• wheatberries</li> </ul>	<b>YES</b> – Contains all parts of the grain, so you're getting all the nutrients of the whole grain.
<ul style="list-style-type: none"> <li>• wheat, or wheat flour</li> <li>• semolina</li> <li>• durum wheat</li> <li>• organic flour</li> <li>• stoneground</li> <li>• multigrain (may describe several whole grains or several refined grains, or a mix of both)</li> </ul>	<b>MAYBE</b> – These words are accurate descriptions of the package contents, but because some parts of the grain <b>MAY</b> be missing, you are likely missing the benefits of whole grains. When in doubt, don't trust these words!

<b>NO</b> – These words never describe whole grains.		
Flour	Instantized flour	Hominy grits
Enriched flour	Phosphated flour	Hominy
White flour	Self-rising flour	Farina
Wheat flour	Enriched self-rising flour	Semolina
All-purpose flour	Bread flour	Degerminated corn meal
Unbleached flour	Cake flour	Enriched rice
Bromated flour	Durum flour	Rice flour
Enriched bromated flour	Corn grits	Couscous
Bran	Wheat Germ	

Source: <https://www.fns.usda.gov/sites/default/files/WholeGrainResource.pdf>





## Identifying Whole Grains

**Instructions:** Identify which of these grains are whole grains. Place a mark in the “Yes, It is a Whole Grain” column if it is or in the “No, It is not a Whole Grain” column if it is not.

Grains	Yes, It is a Whole Grain	No, It is not a Whole Grain
Amaranth		
Bulgur (cracked wheat)		
Buckwheat groats		
Brown rice		
Couscous		
Degerminated cornmeal		
Graham flour		
Grits		
Instant oatmeal		
Long-grain white rice		
Millet flakes		
Pearled (also called pearl) barley		
Quinoa		
Rolled oats		
Semolina		
Wheat flour		
Rye berries		
Whole-grain barley		
Whole wheat flour		
White whole wheat flour		





## Grain Products



Amaranth



Bulgur (cracked wheat)



Buckwheat groats



Brown rice



Couscous



Degerminated cornmeal



Graham flour



Grits



Instant Oatmeal



Long-grain white rice



Millet flakes



Pearled (also called pearl)  
barley



## Grain Products



Rolled Oats



Semolina



Wheat flour



Rye berries



Whole-grain barley



Whole wheat flour



White whole wheat flour



## Protein Equivalent

According to MyPlate, what counts as an ounce equivalent in the Protein Foods Group? In general, 1 ounce of meat, poultry or fish,  $\frac{1}{4}$  cup cooked beans, 1 egg, 1 tablespoon of peanut butter, or  $\frac{1}{2}$  ounce of nuts or seeds can be considered as 1-ounce equivalent from the Protein Foods Group.

The chart lists specific amounts that count as 1-ounce equivalent in the Protein Foods Group toward your daily recommended intake:

	<b>Amount that counts as 1 ounce equivalent in the Protein Foods</b>	<b>Common portions and ounce equivalents</b>
Meats	1 ounce cooked lean beef	1 small steak (eye of round, filet) = $3\frac{1}{2}$ to 4 ounce equivalents
	1 ounce cooked lean pork or ham	1 small lean hamburger = 2 to 3 ounce equivalents
Poultry	1 ounce cooked chicken or turkey, without skin or bone	1 small chicken breast half = 3 ounce equivalents
	1 sandwich slice of turkey (4 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x 1/8")	$\frac{1}{2}$ Cornish game hen = 4 ounce equivalents
Seafood	1 ounce cooked fish or shellfish	1 can of tuna, drained = 3 to 4 ounce equivalents 1 salmon steak = 4 to 6 ounce equivalents 1 small trout = 3 ounce equivalents
Eggs	1 egg	3 egg whites = 2 ounce equivalents 3 egg yolks = 1 ounce equivalent  <b>In schools</b> $\frac{1}{2}$ egg = 1 ounce equivalent
Nuts and Seeds	$\frac{1}{2}$ ounce of nuts (12 almonds, 24 pistachios, 7 walnut halves) $\frac{1}{2}$ ounce of seeds (pumpkin, sunflower or squash seeds, hulled, roasted) 1 tablespoon of peanut butter or almond butter	1 ounce of nuts or seeds = 2 ounce equivalents  <b>In schools</b> 2 tablespoons peanut butter = 1 ounce equivalents
Beans and Peas	$\frac{1}{4}$ cup of cooked beans (such as black, kidney, pinto, or white beans) $\frac{1}{4}$ cup of cooked peas (such as chickpeas, cowpeas, lentils, or split peas) $\frac{1}{4}$ cup of baked beans, refried beans  $\frac{1}{4}$ cup (about 2 ounces) of tofu 1 oz tempeh, cooked $\frac{1}{4}$ cup roasted soybeans 1 falafel patty (2 $\frac{1}{4}$ ", 4 oz)	1 cup split pea soup = 2 ounce equivalents  1 cup lentil soup = 2 ounce equivalents  1 cup bean soup = 2 ounce equivalents  1 soy or bean burger patty = 2 ounce equivalents

Source: <https://www.choosemyplate.gov/protein-foods-nutrients-health>







## Vegetable Subgroups



Acorn Squash



Artichokes



Asparagus



Avocado



Bamboo Shoots



Beans, Green or Wax



Bean Sprouts



Beet Greens



Beets



Bell or Chili Peppers



Black Beans



Black-eyed Peas, Mature, Dry

## Vegetable Subgroups, continued



Bok Choy (Cabbage Chinese  
or Celery)



Breadfruit



Broccoli



Brussels Sprouts



Butternut Squash



Cactus



Carrot



Cassava



Cauliflower



Celery



Chayote (Mirliton)



Cherry Peppers



## Vegetable Subgroups, continued



Chicory



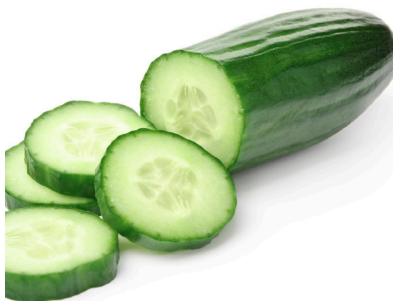
Chinese Snow Peas



Collard Greens



Corn



Cucumbers



Dark Green Leafy Lettuce



Edamame



Eggplant



Escarole Endive



Fresh cowpeas, field peas, or  
black-eyed peas (not dry)



Garbanzo Beans  
(chickpeas)



Grape Leaves

## Vegetable Subgroups, continued



Great Northern Beans



Green Cabbage



Green Onions



Green Peas, Dry



Hubbard Squash



Iceberg (Head) Lettuce



Jicama (Yam Bean)



Kale



Kidney Beans



Kohlrabi



Lentils



Lima Beans, Canned,  
Fresh or Frozen



## Vegetable Subgroups, continued



Lima Beans, Dry



Mung Beans



Mushrooms



Mustard Greens



Navy Beans



Okra



Onions



Parsley



Parsnips



Pepperoncini



Pigeon Peas



Pimentos

## Vegetable Subgroups, continued



Pink Beans



Pinto Beans



Plantains



Poi



Potato Products, White



Pumpkin



Radishes



Red Cabbage



Red/Orange Peppers



Romaine Lettuce



Rutabagas



Salsa



## Vegetable Subgroups, continued



Sauerkraut



Seaweed



Small Red Beans



Soybeans, Dry, Mature



Spinach



Split Peas



Sweet Potatoes



Swiss Chard



Taro (Malanga)



Tomatillos



Tomato Products



Turnips

## Vegetable Subgroups, continued



Turnip Greens



Watercress



Water Chestnuts



White Beans



Yautia (Tannier)



Zucchini





## Vegetable Subgroup Relay

**Instructions:** Look at the vegetables in the first column and decide which subgroup that vegetable belongs and place an X in that column.

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Acorn Squash					
Artichokes					
Asparagus					
Avocado					
Bamboo Shoots					
Beans, Green or Wax					
Bean Sprouts					
Beet Greens					
Beets					
Bell or Chili Peppers					
Black Beans					
Black-eyed Peas, Mature, Dry					
Bok Choy (Cabbage Chinese or Celery)					
Breadfruit					
Broccoli					
Brussels Sprouts					
Butternut Squash					
Cactus					
Carrot					
Cassava					
Cauliflower					
Celery					
Chayote (Mirliton)					
Cherry Peppers					
Chicory					
Chinese Snow Peas					
Collard Greens					
Corn					
Cucumbers					

## Vegetable Subgroup Relay

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Dark Green Leafy Lettuce					
Edamame					
Eggplant					
Escarole Endive					
Fresh cowpeas, field peas, or black-eyed peas (not dry)					
Garbanzo Beans (chickpeas)					
Grape Leaves					
Great Northern Beans					
Green Cabbage					
Green Onions					
Green Peas, Dry					
Hubbard Squash					
Iceberg (Head) Lettuce					
Jicama (Yam Bean)					
Kale					
Kidney Beans					
Kohlrabu					
Lentils					
Lima Beans, Canned, Fresh or Frozen					
Lima Beans, Dry					
Mung Beans					
Mushrooms					
Mustard Greens					
Navy Beans					
Okra					
Olives					
Onions					
Parsley					
Parsnips					



## Vegetable Subgroup Relay

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Pepperoncini					
Pigeon Peas					
Pimentos					
Pink Beans					
Pinto Beans					
Plantains					
Poi					
Potato Products, White					
Pumpkin					
Radishes					
Red Cabbage					
Red/Orange Peppers					
Romaine Lettuce					
Rutabagas					
Salsa					
Sauerkraut					
Seaweed					
Small Red Beans					
Soybeans, Dry, Mature					
Spinach					
Split Peas					
Sweet Potatoes					
Swiss Chard					
Taro (Malanga)					
Tomatillos					
Tomatoes					
Tomato Products					
Turnips					
Turnip Greens					

## Vegetable Subgroup Relay

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Watercress					
Water Chestnuts					
White Beans					
Yautia (Tannier)					
Zucchini					

Source: <https://www.choosemyplate.gov/>

## Nutrition Facts Label Comparison

### Current Label

# Nutrition Facts

Serving Size 2/3 cup (55g)  
Servings Per Container about 8

Amount Per Serving			
<b>Calories</b> 230		Calories from Fat 72	
		% Daily Value*	
<b>Total Fat</b> 8g			<b>12%</b>
Saturated Fat 1g			<b>5%</b>
Trans Fat 0g			
<b>Cholesterol</b> 0mg			<b>0%</b>
<b>Sodium</b> 160mg			<b>7%</b>
<b>Total Carbohydrate</b> 37g			<b>12%</b>
Dietary Fiber 4g			<b>16%</b>
Sugars 12g			
<b>Protein</b> 3g			
Vitamin A 10%			
Vitamin C 8%			
Calcium 20%			
Iron 45%			

\*Percent Daily Values are based on a 2,000 calorie diet.  
Your Daily Values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300g	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	300g
Dietary Fiber		25g	25g

### New Label

Nutrition Facts	
8 servings per container	
Servings size	2/3 cup (55g)
Amount per serving	
Calories	230
	% Daily Value*
Total Fat 8g	12%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	12%
Dietary Fiber 4g	16%
Total Sugars 12g	
Includes 10g Added Sugars	20%
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 235mg	6%
*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	

What differences do you notice when you first look at the two labels?

- The new label brings calories and serving size to the foreground.
- The print for the number of servings is larger, the serving size has been updated to reflect the number of servings Americans eat and drink, and the type is in a bolder font.
- Due to the increased serving size, the number of calories has increased and is in a bolder font.
- The % Daily Values (DVs) have been updated to the new standards set by the Institute of Medicine (IOM) and the *Dietary Guidelines for Americans*.
- Added sugars are listed on the label in grams and % DV. This is to inform the public the need to reduce the consumption of sugar by limiting the daily intake to 10% of calories.

- FDA now requires the grams of vitamin D and potassium and the % DV to be on the label. Calcium and iron will continue to be required; however, vitamins A and C will no longer be required because deficiencies of vitamins A and C are no longer a concern.
- The footnote area will change to explain the % DV better. It reads: "The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice."

You might see a Nutrition Facts label that looks like the one below. It provides you with the nutrients for a single serving and the complete package. If you were to consume the entire contents of the package, look at the saturated fat, sodium, and added sugars you would consume. For products that contain two servings and a single serving is consumed, use the Per serving column. If the complete container is consumed, use Per container column. This type of label may help consumers make healthier food choices.

<b>Nutrition Facts</b>			
2 servings per container			
<b>Servings size</b>		<b>1 cup (255g)</b>	
<b>Calories</b>	Per serving	Per container	
	<b>220</b>	<b>440</b>	
	% DV*	% DV*	
<b>Total Fat</b>	5g 6%	10g	13%
Saturated Fat	2g 10%	4g	20%
Trans Fat	0g	0g	
<b>Cholesterol</b>	15mg 5%	30mg	10%
<b>Sodium</b>	240mg 10%	480mg	21%
<b>Total Carb.</b>	35g 13%	70g	25%
Dietary Fiber	6g 21%	12g	43%
Total Sugars	7g	14g	
Incl. Added Sugars	4g 8%	8g	16%
<b>Protein</b>	9g	18g	
Vitamin D	5mcg 25%	10mcg	50%
Calcium	200mg 15%	400mg	30%
Iron	1mg 6%	2mg	10%
Potassium	470mg 10%	940mg	20%
*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.			

Source: U.S. Food and Drug Administration. (2016). *Changes to the nutrition facts label*. Retrieved from <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm385663.htm>

## The New Nutrition Facts Label – Key Changes

The U.S. Food and Drug Administration has finalized a new Nutrition Facts label for packaged foods that will make it easier for you to make informed food choices that support a healthy diet. The updated label has a fresh new design and reflects current scientific information, including the link between eating patterns and chronic diseases.

### 1. Servings

The number of “servings per container” and the “Serving size” declaration have increased and are now in larger and/or bolder type. Serving sizes have been updated to reflect what people actually eat and drink today. For example, the serving size for ice cream was previously 1/2 cup and now is 2/3 cup.

There are also new requirements for certain size packages, such as those that are between one and two servings or are larger than a single serving but could be consumed in one or multiple sittings.

### 2. Calories

“Calories” is now larger and bolder.

### 3. Fats

“Calories from Fat” has been removed because research shows the type of fat consumed is more important than the amount.

### 4. Added Sugars

“Added Sugars” in grams and as a percent Daily Value (%DV) is now required on the label. “Added Sugars” include sugars that have been added during the processing or packaging of a food. Scientific data shows that it is difficult to meet nutrient needs while staying within calorie limits if you consume more than 10 percent of your total daily calories from added sugar.

### 5. Nutrients

The lists of nutrients that are required or permitted on the label have been updated. Vitamin D and potassium are now required on the label because Americans do not always get the recommended amounts. Vitamins A and C are no longer required since deficiencies of these vitamins are rare today. The actual amount in grams in addition to the %DV must be listed for vitamin D, calcium, iron, and potassium.

The daily values for nutrients have also been updated based on newer scientific evidence. The daily values are reference amounts of nutrients to consume or not to exceed and are used to calculate the %DV.

## Nutrition Facts

8 servings per container

**Servings size** 2/3 cup (55g)

Amount per serving

**Calories** 230

% Daily Value\*

**Total Fat** 8g 10%

Saturated Fat 1g 5%

Trans Fat 0g

**Cholesterol** 0mg 0%

**Sodium** 160mg 7%

**Total Carbohydrate** 37g 13%

Dietary Fiber 4g 14%

Total Sugars 12g

Includes 10g Added Sugars 20%

**Protein** 3g

Vitamin D 2mcg 10%

Calcium 260mg 20%

Iron 8mg 45%

Potassium 235mg 6%

\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

### 6. Footnote

The footnote at the bottom of the label has changed to better explain the meaning of %DV. The %DV helps you understand the nutrition information in the context of a total daily diet.

Source: U.S. Food and Drug Administration. (2016). *Changes to the nutrition facts label*. Retrieved from <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm385663.htm>

## Quick Tips for Understanding a Food Label

For a healthier you, use this tool to make smart food choices quickly and easily. Try the following tips:

- Look at the serving size and how many servings you are actually consuming. If you double the servings you eat, you double the calories and nutrients, including the percent of the daily values (DV).
- Make your calories count. Look at the calories on the label and compare them with what nutrients you are getting to decide whether the food is worth eating. When one serving of a single food item has over 400 calories per serving, it is high in calories. You have to look at the food item.
- Keep these low: saturated fats, *trans* fats, cholesterol, and sodium.
- Get enough of these: potassium, fiber, vitamins A, C, and D, calcium, and iron.
- Use the % Daily Value (DV) column when possible: (5% DV or less is low, 20% DV or more is high.) Check servings and calories.
- Don't sugarcoat it. Since sugars contribute calories with few, if any, nutrients, look for foods and beverages low in added sugars. Read the ingredient list and make sure that added sugars are not one of the first few ingredients. Some names for added sugars (caloric sweeteners) include sucrose, glucose, high fructose corn syrup, corn syrup, maple syrup, and fructose.
- Know your fats. Look for foods low in saturated fats, *trans* fats, and cholesterol to help reduce the risk of heart disease (5% DV or less is low, 10 – 19% is a good range, 20% DV or more is high). Most of the fats you eat should be polyunsaturated and monounsaturated fats. Keep total fat intake between 20% and 35% of total daily calories.
- Reduce sodium (salt). About 1 teaspoon of sodium (2,300 mg) is the recommended daily limit. Most of the sodium people eat comes from processed foods, not from the salt shaker.

Source: <https://www.fda.gov/food/resourcesforyou/consumers/ucm267499.htm>





## Cafeteria Connection: Serving the *Dietary Guidelines*

School Breakfast, Lunch, and Afterschool Snack Programs and the Summer Food Service Program present unique opportunities to put the *Dietary Guidelines for Americans (DGAs)* into action. Put the *DGAs* on the serving line with the menu suggestions below. You can use these tips at home, too.

Breakfast is a great meal to encourage whole grain foods and support the *DGA* dietary tip to “make half your grains whole.” Try these whole grain options:

- Serve whole grain, ready-to-serve, and cooked cereals.
- Offer toast made with 100% whole wheat bread.
- Wrap brown rice, scrambled eggs, cheese, and salsa in whole wheat tortillas.
- Provide whole wheat bagels with flavored low-fat or fat-free cream cheese.
- Serve egg and cheese breakfast sandwiches on whole grain English muffins.
- Add whole wheat flour and rolled oats to recipes for baked bread items.

Vary the vegetables offered during lunch. Include different colors, such as dark green and red/orange, and different types of vegetables, such as legumes and starchy vegetables, several times a week. Try one of the following ideas:

- Create seasonal garden bar choices with a wide variety of deeply colored vegetables.
- Put more dark green in specialty salads by combining fresh spinach or romaine lettuce with traditional iceberg lettuce blends.
- Serve soups made with beans, cubed sweet potatoes or winter squash, and sliced carrots.
- Introduce cultural food items featuring dried beans, peas, and lentils.
- Assemble a new menu item, rice bowls, by layering assorted vegetables and lean meat mixtures over brown rice.
- Make new menu item, wraps, featuring brown rice and cooked beans/meat, salsa, cheese, and chopped tomato.

The Afterschool Snack Program and the Summer Food Service Program are perfect places to add more fresh fruit to children's eating patterns. Summer food service programs can capitalize on the variety of mouth-watering fresh fruits in season during summertime. Try these creative combinations:

- Chunk seasonal melons and serve with pretzel sticks for Make Your Own Fruit Kabobs.
- Layer fresh fruit and berries with yogurt (or use fruit canned in juice, drained, for a mixed fruit cup).





A Taste of Food and Fitness

**Lesson 3:**  
**The Energy Nutrients**





## Protein Daily Recommendations

Daily recommendations for protein are complicated because the amount we need changes with age. MyPlate recommends the following:

- Infants require about .35 oz a day
- Toddlers ages 2 – 3 need an average of 2 oz a day
- Boys and girls 4 – 8 need up to 4 oz a day
- Pre-adolescent boys and girls 9 – 13 need up to 5 oz a day
- Teenage boys 14 – 18 need up to 6 ½ oz a day
- Teenage girls 14 – 18 need about 5 oz a day
- Adult men 19+ need about 6 ½ oz a day
- Adult women 19+ need about 5 ½ oz a day

One important exception is pregnant or lactating women. The recommended intake for them is 2 ½ oz of protein a day.

Another way to look at protein requirements is as a percentage of calories. The Institute of Medicine recommends we get at least 10% and no more than 35% of calories from protein.

Most people get enough protein, but some might do well to add a few additional sources.

Some protein foods have a different requirement in the school meal programs. Use the Food Buying Guide for correct protein crediting in school meals.

Source: <http://www.webmd.com/food-recipes/protein>

# Carbohydrates

Most carbohydrates are plant-based foods. Plants use sunshine and basic elements in the soil in a chemical process (photosynthesis) to make energy in the form of sugars. Plants convert sugars to starches for storage.

## One

All carbohydrates, sugar, starch, and fiber, are made of molecules called saccharides (sugars). A single unit is called a monosaccharide, which means one (mono-) sugar unit (saccharide). There are three single sugar units.

1. Glucose (the type that circulates through the body in the blood supply)
2. Fructose (fruit sugar)
3. Galactose (only found in milk)

## Two

Most of the sugars in foods are two (di-) units joined, or a disaccharide. There are three disaccharides.

1. Glucose + Fructose = Sucrose (known as table sugar)
2. Glucose + Galactose = Lactose (the sugar naturally found in milk)
3. Glucose + Glucose = Maltose (known as malt sugar)

## Three or More

Starch and fiber, complex carbohydrates, are polysaccharides. These carbohydrates are many (poly-) units linked together. Starches can be hundreds of units joined.

The body breaks down all carbohydrates into single units. The glucose from milk, table sugar, or starch is all the same. The body changes fructose and galactose into glucose. Since all glucose units are the same, the cells in the body cannot tell what food supplied the glucose.

The body reacts to how quickly glucose is absorbed into the blood stream. A sugar's single bond breaks easily; units are absorbed quickly. The many bonds of a starchy food take longer to break apart. Fruit's fructose and milk's galactose are changed into glucose and enter the blood stream at a slower rate.

Fiber found in plants is the supporting structure of leaves, stems, and seeds. Fiber is a polysaccharide like starch. The difference between fiber and starch is that bonds hold fiber together and the digestive enzymes cannot break down the bonds. Therefore, fiber moves through the body intact and does not provide energy to the body as sugars and starches.

Fruits, vegetables, whole grains, and legumes provide the body with much needed fiber, vitamins, and minerals. Pastries, desserts, candies, and sweetened beverages often lack essential nutrients. The glucose in all foods and beverages is identical. The bounty of nutrients - or lack of needed nutrients - carbohydrate-rich foods provide is the big difference.

## Added Sugars and Food Labels

The sugars listed on food labels are similar to the glucose units in the body. The current label lists all sugars, natural and added, in one amount.

Look for sources of sugars and other sweeteners, usually words that end in the letters "ose," such as sucrose in the ingredients list.

The new label will list Added Sugars in grams and % Daily Value.

The following are common added sugars: sugar or brown sugar, sucrose, dextrose, fructose, high-fructose corn syrup, corn sweetener, concentrated fruit juices, invert sugar, honey, malt syrup, maltose, and molasses.

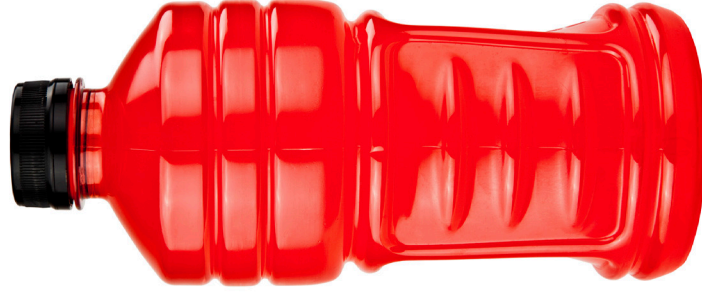
Source: *Nutrition 101: A Taste of Food and Fitness, 3rd Edition*

Cereal Label	
NUTRITION FACTS	
Serving Size 1 cup (52g)	
Amount Per Serving	
Calories 190	Calories from Fat 10
% Daily Value*	
Total Fat 1g	2%
Cholesterol 0mg	0%
Sodium 10mg	0%
Potassium 170mg	5%
Total Carbohydrate 44g	15%
Dietary Fiber 5g	20%
Sugars 1g	
Protein 4g	
Vitamin A	0%
Vitamin C	0%
Calcium	0%
Iron	10%
Vitamin D	0%
Thiamin	25%
Riboflavin	25%
Niacin	25%
Vitamin B <sub>6</sub>	25%
Folate	25%
Vitamin B <sub>12</sub>	25%
Phosphorus	8%
Magnesium	8%
Zinc	10%
Copper	4%
<b>INGREDIENTS:</b> Whole Wheat, Sugar, Brown Sugar, Gelatin <b>VITAMINS AND MINERALS</b> Niacinamide, Reduced Iron, Zinc Oxide (Source of Zinc), Vitamin B <sub>6</sub> , Riboflavin (Vitamin B <sub>2</sub> ), Thiamine Mononitrate (Vitamin B <sub>1</sub> ), Vitamin B <sub>12</sub> ), Folic Acid.	





# Beverage Comparison



Nutrition Facts		
Serv. Size 1 Bottle (32 fl oz.)		
Calories 200		
Amount/Serving		% DV*
Total Fat 0g		0%
Sodium 375mg		15%
Potassium 87mg		2%
Total Carb. 55g		17%
Sugars 52g		
Protein 0g		
Niacin		37%
Vitamin B <sub>6</sub>		37%
Vitamin B <sub>12</sub>		37%
Magnesium		†
† This is a significant source of calories from fat, saturated fat, trans fat, cholesterol, dietary fiber, vitamin A, vitamin C, calcium and iron.		
*Percent Daily Values (DV) are based on a 2,000 calorie diet.		



Nutrition Facts		
Serv. Size 1 Bottle (20 fl oz.)		
Calories 240		
Amount/Serving		% DV*
Total Fat 0g		0%
Sodium 75mg		3%
Total Carb 65g		22%
Sugars 65g		
Protein 0g		
Not a significant source of fat, cal., sat. fat, trans fat, choles., fiber, vitamin A, vitamin C, calcium and iron.		
*Percent Daily Values (DV) are based on a 2,000 calorie diet.		



Nutrition Facts		
Serv. Size 1 Bottle (15.2 fl oz.)		
Calories 210		
Amount/Serving		% DV*
Total Fat 0g		0%
Saturated Fat 0g		0%
Trans Fat 0g		0%
Cholesterol 0g		0%
Sodium 20mg		1%
Potassium 470mg		13%
Total Carb. 51g		17%
Sugars 48g		
Protein 1g		
Vitamin C		190%
Calcium		4%
Vitamin B <sub>6</sub>		8%
Magnesium		45%
Not a significant source of fat, cal., sat. fat, trans fat, choles., fiber, vitamin A, vitamin C, calcium and iron.		
*Percent Daily Values (DV) are based on a 2,000 calorie diet.		



Nutrition Facts		
Serv. Size 1 Can (12 fl oz.)		
Calories 140		
Amount/Serving		% DV*
Total Fat 0g		0%
Sodium 45mg		2%
Total Carb 39g		13%
Sugars 39g		
Protein 0g		
Not a significant source of fat, cal., sat. fat, trans fat, choles., fiber, vitamin A, vitamin C, calcium and iron.		
*Percent Daily Values (DV) are based on a 2,000 calorie diet.		



Nutrition Facts		
Serving Size 12 fl oz (360 mL)		
Servings Per Container 6		
Amount Per Serving		% Daily Value*
Calories 140		
Total Fat 0g		0%
Sodium 65mg		3%
Total Carbohydrate 38g		13%
Sugars 38g		
Protein 0g		
Not a significant source of calories from fat, saturated fat, trans fat, cholesterol, dietary fiber, vitamin A, vitamin C, calcium and iron.		
*Percent Daily Values are based on a 2,000 calorie diet.		



Nutrition Facts		
Serving Size 8 fl oz (240mL)		
Servings Per Container 16		
Amount Per Serving		% Daily Value*
Calories 0	Calories from Fat 0	
Total Fat 0g		0%
Trans Fat 0g		
Sodium 0mg		0%
Total Carbohydrate 0g		0%
Protein 0g		
*Percent Daily Values are based on a 2,000 calorie diet.		





## Non-Nutritive Sweeteners

Non-nutritive sweeteners (sugar substitutes) are sweet-tasting compounds. They are hundreds of times sweeter than table sugar. Small amounts of these sweeteners replace larger amounts of conventional sweeteners in food products. The result is a sweet taste with few added calories.

Each non-nutritive sweetener is different. For example, some can be used in baking while others lose their sweet taste when exposed to high temperatures.

The use of non-nutritive sweeteners is a personal choice. Non-nutritive sweeteners make it possible to include sweet-tasting foods in calorie-control diets and diabetic eating plans. A lingering after-taste may occur with some sweeteners.

Foods made with non-nutritive sweeteners need to be part of a balanced meal plan. It is not healthful to have unlimited amounts of a food or beverage just because it is “sugar-free.”

In the United States, non-nutritive sweeteners are approved for use in foods, beverages, and medicines. Information on a few of these is listed below.

### Acesulfame K Facts (Sweet One)

- Use to sweeten
  - ✓ beverages
  - ✓ baked and pasteurized foods
  - ✓ candies
  - ✓ medicines such as cough drops
- Not digested; it is excreted unchanged
- About 200 times sweeter than sugar
- Does not promote tooth decay

### Aspartame Facts (In most low calorie drinks)

- Made of two amino acids—aspartic acid and phenylalanine
- Digested and metabolized as aspartic acid, phenylalanine, and a small amount of methanol
- Warning that product contains phenylalanine must be on the food label
- About 200 times sweeter than sugar
- Does not promote tooth decay
- Does not retain sweet taste after high temperatures—not good for baking

*Note: Individuals with Phenylketonuria (PKU) should not use aspartame because they are unable to metabolize the amino acid phenylalanine.*

### Neotame Facts (Truvia ®)

- Made of two amino acids—aspartic acid and phenylalanine; due to small amounts used, PKU labeling is not required
- Sweetest of the non-nutritive sweeteners; 7,000–13,000 times sweeter than sugar
- Stays sweet at high temperatures; approved for baking and cooking

## Saccharin Facts

- Oldest of the non-nutritive sweeteners
- 300–700 time sweeter than sugar
- May reduce the risk of tooth decay
- Heat stable; suitable for baking, cooking, and canning/preserving

## Sucralose Facts (Splenda ®)

- Made from table sugar (sucrose)
- Not digested or absorbed
- Heat stable
- Used to sweeten
  - ✓ beverages
  - ✓ cereals
  - ✓ baked items
  - ✓ medical foods
  - ✓ candies

Sucralose is the exception to the “ose” rule to find sources of added caloric sweeteners in a product ingredient list. Any grams of sugar listed on the nutrition facts label of products sweetened with sucralose are from other ingredients, not the sucralose.

## Stevioside Facts (Stevia ®)

- Used to sweeten
  - ✓ beverages
  - ✓ cereals
  - ✓ baked items
- Plant-based
- 100–300 times sweeter than sugar
- Has no carbohydrates, calories, or artificial ingredients
- Can be found in liquid or powder form

## Other Sweeteners

### Sugar Alcohols Facts

- Not sugar or alcohol; another form of carbohydrate
- Includes sorbitol, mannitol, and maltitol
- Provide calories, but fewer than sugar
- Potential laxative effect in large amounts

Foods with sugar alcohols may use the term “sugar-free” on the label. Many food products use sugar alcohols and non-nutritive sweeteners combined. Sugar-free chewing gums are sweetened with sugar alcohols since they do not promote tooth decay.

**All artificial sweeteners should be used in moderation. There is inconclusive research as to how safe they are and how much is safe to consume.**



## Fats and Oils

The word lipid refers to fats and oils. This handout explains fats and oils in the meal pattern and lipids in the body.

### Dietary Fats

Dietary fats are found in both plant and animal foods. Fats are solid at room temperature. Oils are fats that are liquid at room temperature. All lipids are concentrated sources of energy, or calories.

Both fats and oils are made up of different fatty acids, similar to how proteins are made up of different amino acids. Fatty acids are divided into two groups: essential and non-essential. If the body cannot make the fatty acid from another source, it is called essential. Non-essential fatty acids can be made from other fatty acids by the body. Two fatty acids, alpha-linolenic acid (ALA) and linoleic acid (LA) are essential fatty acids. Humans must get these fats in the meal pattern, as we cannot make these vital fats from other dietary fats.

Every fat and oil is made of a mix of polyunsaturated, monounsaturated, and saturated fatty acids. For example, if the fat in butter contains mostly saturated fatty acids, it will also contain some polyunsaturated and monounsaturated fatty acids.

### Types of fatty acids

*Trans* fatty acids (TFAs) are made when hydrogen is added to vegetable oils in a processing plant. The process changes unsaturated oils to partially saturated fats (partially hydrogenated oil), extending the shelf life of the food. Shortening, stick margarine, and some frying oils are examples of TFAs. Food labels will list partially hydrogenated vegetable oils as an ingredient. Hydrogenation increases the shelf life and flavor stability in food. Snack crackers, chips, cookies, and fried foods are often sources of *trans* fatty acids.

Saturated fatty acids (SFAs) are solid at room temperature. Animal fats, such as beef fat, lard, and butter are examples of foods with the most SFAs. Some oils, such as coconut and palm oil are also sources of SFAs.

### Oils

Oils should be considered as part of a healthy eating pattern because they are a rich source of essential fatty acids and vitamin E. The most common oils consumed are from plants including canola, corn, olive, peanut, safflower, soybean, and sunflower.

Monounsaturated fats (MUFAs) are the primary fatty acids found in olive or canola oils, tree nuts such as walnuts or almonds (and oils made from these nuts), peanuts, and avocados. Meal plans from the Mediterranean area are rich in MUFAs.

Polyunsaturated fats (PUFAs) are major fatty acids found in corn, soybean, or safflower oil and fish.

## Fats and Oils, continued

### Omega Fatty Acids

Omega is a letter in the Greek alphabet. Some fatty acids are grouped using this letter and a number. The groups are omega-3 and omega-6.

#### Omega-3 Fatty Acids

There are three groups of omega-3 fatty acids. ALA (alpha-linoleic acid), DHA (docosahexaenoic acid), and EPA (eicosapentaenoic acid) are all polyunsaturated fatty acids. ALA is found in many plant oils, including canola and flaxseed oil. ALA is an essential fatty acid. The body can change ALA into DHA or EPA, but it is not an efficient process. Most Americans do not eat enough foods rich in omega-3 fatty acids DHA and EPA. The *Dietary Guidelines for Americans* recommend fish more often to increase these healthy fats. Fish and other seafood are natural sources of DHA and EPA. Experts say to check with your state licensed healthcare professional before beginning to take fish oil tablets for more DHA and EPA in the meal pattern.

#### Omega-6 Fatty Acids

Omega-6 fatty acids are also polyunsaturated fatty acids. The essential fatty acid linoleic acid is an omega-6 fatty acid. The North American food supply provides plenty of omega-6 fatty acids from vegetable oils such as corn, safflower, and soybean.

Omega-3 and omega-6 fatty acids play many roles in the body. Together they support a healthy brain and balance important body processes such as blood clotting and inflammation. Inflammation is the body's response to injury and helps with healing. It is an important body process. How each fatty acid contributes to health continues to be studied.

Balance between these types of fatty acids is important. All are needed for good health. Check your food choices and be sure to include foods that provide all types of omega fatty acids. The *Dietary Guidelines for Americans* encourage more mono- and polyunsaturated fats from plant oils and fish to replace saturated and *trans* fats in the diet.





## Nutrition Nugget: Lipids in the Body

The lipids in our meal pattern influence the amount and type of lipids in our body. In the blood, lipids are mixed with proteins. This mixture makes it easier to move fats around the body to where they are needed. These mixtures of lipids and protein are called lipoproteins (lipo for lipid or fat mixed with protein). Blood tests are used to find out how much of each kind of lipoprotein is in the body.

Every cell in our body needs a small amount of fat daily. The fatty acids our body cannot make from other fats (also called essential fatty acids) can be supplied by a total of two to four tablespoons of oils each day.

Blood cholesterol is a sterol, a soft, waxy substance made in the body. It is a fat-like compound in the blood that is made up of different types of lipoproteins. The liver makes more cholesterol each day than most people eat in their meal pattern. Cholesterol is an important part of hormones. High blood LDL cholesterol is an indicator of cardiovascular disease. The two foods associated with raising blood cholesterol are saturated fats and *trans* fats. Mono- and polyunsaturated fats can help lower blood cholesterol levels.

Dietary cholesterol is only found in animal-based foods. It can raise blood cholesterol in some people. Trimming saturated and *trans* fats from food and replacing them with mono- and polyunsaturated fats will help lower LDL levels.

The body makes three types of lipoproteins.

- HDL stands for high-density lipoprotein, also known as the “good” type of blood cholesterol. HDL’s main job is to pick up cholesterol from tissues, transport it to the liver, and help remove it. High levels of HDL help protect against heart disease.
- LDL stands for low-density lipoprotein, also known as the “bad” type of blood cholesterol. LDL’s job is to take cholesterol made in the liver and from other sources to the arteries and tissues. We need some LDL to be healthy, but high levels of LDL in the blood may lead to a buildup in the arteries and a risk for heart disease.
- VLDL stands for very low-density lipoprotein, also considered a “very bad” type of blood cholesterol. It contains the highest amount of triglycerides. Triglycerides are one of the three classes of dietary fats and the main form of fat in food and the human body. VLDL is converted to low-density lipoprotein (LDL) in the blood.

## Total Fat

If a food has less than 0.5 grams of *trans* fat per serving, the label will show zero (0) grams. A food with 0.25 grams per serving would provide 1 gram in four servings of the food. Examples might be snack crackers, cookies, or other foods made with partially hydrogenated vegetable oil.

Check the ingredient label for the words *partially hydrogenated vegetable oil* to know if a food might have *trans* fatty acids.

Labels must list Total and Saturated Fat in grams and %Daily Value.

DGA suggest 10% or less of Saturated Fat. This is the requirement in the school nutrition program.

*Trans* Fat is listed in grams.

Listing amounts of Mono- and Polyunsaturated Fats is optional.

Total fat minus Saturated and *Trans* fats will give an estimated combined MUFAs and PUFAs

### Nutrition Facts

8 servings per container

**Servings size** 2/3 cup (55g)

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**Amount per serving**

**Calories** 230

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	% Daily Value*
<b>Total Fat</b> 8g	10%
Saturated Fat 1g	5%
<i>Trans</i> Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 160mg	7%
<b>Total Carbohydrate</b> 37g	13%
Dietary Fiber 4g	14%
Total Sugars 12g	
Includes 10g Added Sugars	20%
<b>Protein</b> 3g	
<hr/>	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 235mg	6%

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\*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Serving size is important.

Food labels do not give a % Daily Value for *trans* fat – no value has been set by FDA. The DGAs suggest as low as possible. School Nutrition Programs require 0 grams.

Animal products are the only foods that contain cholesterol.





## The Lowdown on Low-Fat Recipes

It is helpful to know the role fat plays in a recipe before changing the recipe to be lower in fat. Low-fat baking is an art form all its own. The tips below are a great place to start.

The rule of thumb for any recipe makeover is to test after every change. Have fun updating your favorite recipes.

### Common ways to reduce fat in baked good recipes

- Try the recipe with up to one-third less fat without a replacement - it may work fine!
- Use unsweetened applesauce or other fruit purees to replace half or more of the fat in a recipe.
- Use plain low-fat or fat-free yogurt to replace half or more of the fat in the recipe.

Note: Replace fat with a measure for measure amount such as  $\frac{1}{2}$  cup applesauce for  $\frac{1}{2}$  cup margarine. Because fruit puree has more liquid than solid fat, you may need to adjust the liquid in the recipe.

Many foods have a low-fat option that can be used in recipes. Examples include

- Fat-free milk for whole or 2% milk
- Evaporated skim milk for regular evaporated milk
- Low-fat plain yogurt or fat-free sour cream for regular sour cream

### Flavor

Flavor is a major role for fats in recipes. Butter flavors baked goods. Butter can be reduced in a recipe to decrease saturated fat. A butter/margarine blend or butter/oil blend are two options to keep flavor when reducing the amount of fat or using a different type of fat.

Recipes that mix butter with sugar have a unique caramel flavor. Increase the amount of flavorings to make up for less butter in a recipe.

### Texture

Fat helps keep baked goods tender. The fat tenderizes the baked product by coating the flour pieces. This coating weakens the gluten in the flour and keeps the protein in flour from linking to other proteins. When fat is reduced, baked items can be tough. Replacing some of the fat with unsweetened applesauce is one way to help keep baked goods tender. Here is another tip to try, use whole wheat pastry flour. Pastry flour, also called cake flour, has less protein than all-purpose flour, so it will produce a more tender product. Whole wheat pastry flour adds whole grain goodness, too.

Egg yolks are a source of fat and cholesterol. They also help mix fat and protein. When a recipe calls for two eggs, try this idea: Use one whole egg and two egg whites for the second egg. Using all egg whites can make baked goods tough.

**Moisture**

Fat helps baked goods hold moisture. Oils have more moisture (because they are liquids) than butter or shortening, so flour may need to be increased slightly. Applesauce also adds moisture, so be sure to adjust recipes where it replaces some of the fat.

When butter or shortening is mixed with granulated sugar, it traps moisture and air in the batter. Reducing the fat or sugar will produce a different product.

Pureed prunes can make a product dry; adjust liquid in the recipe as needed. Oats are also likely to absorb liquid, so recipes with oats or oat bran may need an adjustment of the liquid ingredients. Testing is the key to finding the right mix.

**Technique**

Lower fat baking requires special attention to how the recipe is measured and mixed.

Weighing flour is the most accurate way to measure flour. Another method that works well is the spoon-and-sweep method. Stored flour can settle and compact. Stir flour to add air. Then spoon the free flowing flour into the measuring cup and sweep the surface level with a knife.

Never over mix a lower fat batter. Stirring too much helps the proteins bind and makes the product tough. Spoon and stir in flour rather than using a mixer. The mixer will often over mix the product and add to toughness.

**More recipe ideas**

- The fat in cheese helps carry the flavor. Use a flavorful cheese, such as sharp cheddar, with a lower fat cheese, such as part-skim mozzarella. Try one part full-flavored cheese to two parts reduced-fat cheese.
- Nuts and seeds add flavor and healthy fats. Add a small amount to a lower fat recipe for more flavor and crunch.
- Remove extra fat from cooked ground beef. Put the cooked meat in a colander. Drain well. Use in spaghetti sauce, tacos, and chili recipes.
- Low-fat margarines will not work well in recipes to replace other fats. These spreads contain large amounts of water.
- Pay attention to portions. A sliver of a rich dessert is another way to reduce fat. Enjoy just a taste or two.



## Cafeteria Connection: Limits on Lipids

The Healthy, Hunger-Free Kids Act calls on schools to reflect the *Dietary Guidelines for Americans* in meal programs. Meals need to provide students with minimum amounts of nutrients needed for growth and health. Nutrients to focus on, such as dietary fat, are balanced for good health. Over the menu week, limits are

- Less than 10% of total calories from saturated fat
- Zero *trans* fat

When it comes to heart health, the type and amount of fat we eat makes a big difference. Many Americans eat too much saturated fat and cholesterol, which increase unhealthy blood lipids (low-density lipoproteins, or “LDL cholesterol”). Most of the saturated fat in our meal pattern comes from cheese and other higher fat dairy products, beef, and baked goods like cakes, cookies, and doughnuts. Foods higher in saturated fat usually contain more cholesterol, too.

Look for the amount of saturated fat, *trans* fat, and cholesterol per serving listed on the Nutrition Facts label. Choose foods that have the least amount of all three. A manufacturer can claim a food is low-cholesterol if the product contains 20mg of cholesterol or less and 2g or less of saturated fat per serving.

School nutrition staff have many tools to meet these goals. Well-planned menus with tested recipes are a major tool.

Tested recipes, also called standardized recipes, provide all steps to make a menu item. These recipes list the

- Food items to use
- Specific amounts of each item
- Steps to follow
- Total number of servings (yield)
- Serving size (portion)

Here are some quality measures to follow:

- Select the right food item. The wrong ingredient can change the recipe including the fat content.
- Measure items carefully. An extra cup of oil, shredded cheese, or meat crumbles adds extra fat and calories to a recipe. The extra amount also adds to the program food costs.
- Use the right scoop, ladle, or portion size. Make sure the recipe as served matches the recipe as planned. A pan cut into larger sizes, for example 20 instead of 25 portions, increases fat content and calories per serving by 20%. It also serves 20% fewer students.
- Help students enjoy smaller amounts of condiments and salad dressings. Use portion-packs or other means for portion control. Look for fat-free items that can be served.

- Look for new generation foods that are lower in fat. Check out the cookbook *Recipes for Healthy Kids* on the USDA Team Nutrition website.
- Offer fat-free (skim) or low-fat (1%) milk and yogurt. They are rich in protein, calcium, and other nutrients and lower in saturated fat and cholesterol.
- Try low-fat cottage cheese, part-skim mozzarella, ricotta, and other low-fat or reduced-fat cheeses.
- Omit butter and cream in sauces or as a seasoning for vegetables. Try herbs and spices to add more flavor without the fat.
- Choose lean cuts of meats with minimal visible fat. Trim all outside fat before cooking and remove the skin on poultry.
- Prepare fish baked, broiled, or grilled rather than breaded and fried.
- Avoid using too many processed meats including sausage, bologna, salami, and hot dogs—even those with “reduced fat” labels—they may still be high in calories, saturated fat, and cholesterol. Serve grilled, skinless chicken breast instead.
- Limit certain bakery products like doughnuts, honey buns, cinnamon rolls, cookies, and crackers, which may contain saturated fat and *trans* fat.

These daily work habits will assure meals served meet the goals.



## Fast Facts About Energy Nutrients

Nutrient Information	Protein	Carbohydrate	Fat
<b>Calories</b>	4 Calories per Gram	4 Calories per Gram	9 Calories per Gram
<b>Major Functions</b>	<p>Builds and maintains muscles, tissues, and blood cells.</p> <p>Is an essential part of enzymes and hormones that regulate body functions.</p> <p>Enhances immune function.</p> <p>Can be a source of energy, but is not the body's preferred energy source.</p> <p>Contributes to satiety, the feeling of fullness that signals the body to stop eating.</p>	<p>Provides energy and is the body's preferred energy source.</p> <p>Supplies brain and central nervous system with energy.</p> <p>Provides dietary fiber.</p> <p>Dietary fiber and starch contribute to satiety.</p>	<p>Transports fat-soluble vitamins.</p> <p>Provides structure to cell membranes.</p> <p>Cushions body organs.</p> <p>Contributes to normal nerve and brain development in young children.</p> <p>Is an essential part of hormones that regulate body functions.</p> <p>Provides a concentrated energy source.</p> <p>Provides stored energy for the body.</p>
<b>Types</b>	<p>Complete proteins are found in animal foods.</p> <p>Incomplete proteins are found in plant foods.</p> <p>See <i>Did You Know?</i> section for more information.</p>	<p>Simple sugars are found naturally in fruits and milk and are added to foods during processing or preparation.</p> <p>Starch is a digestible complex carbohydrate found in grains and vegetables.</p> <p>Dietary fiber is an indigestible complex carbohydrate found in plant foods.</p>	<p>Monounsaturated fats (MUFAs) are found in canola oil, olive oil, and most nuts.</p> <p>Polyunsaturated fats (PUFAs) are found in vegetable oils.</p> <p>Saturated fats (SFAs) are found primarily in animal foods and tropical oils, such as palm oil.</p> <p><i>Trans</i> fats are found primarily in partially hydrogenated vegetable oils.</p>

Nutrient Information	Protein	Carbohydrate	Fat
<b>Food Sources</b>	<p>Complete (Animal): Meats, fish, poultry, milk, yogurt, cheese, and eggs</p> <p>Incomplete (Plant): Dried peas and beans, legumes, nuts, and seeds</p>	<p>Simple sugars: Milk, fruits, honey, refined white or brown sugars, high-fructose corn syrup, and other processed sugars</p> <p>Starch: Whole grains, vegetables, dried peas and beans</p> <p>Dietary Fiber: Fruits, vegetables, whole grains, dried peas and beans, nuts, and seeds</p>	<p>Liquid sources of fat: Vegetable oils, fish, nuts, and seeds</p> <p>Solid sources of fat: margarine, butter, shortening, lard, meat, poultry, and dairy products</p> <p>Many grains and vegetables have fat added during preparation or processing</p>
<b>Can the Body Store This Nutrient?</b>	<p>The body uses protein to build tissues and muscles. Protein is not stored, but tissues and muscles can be broken down if protein is not supplied in the diet.</p> <p>Protein is needed regularly in the diet. Excess dietary protein is converted to fat for storage.</p>	<p>The body can store a limited amount of carbohydrate in the muscles and the liver.</p> <p>Excess dietary carbohydrate is converted to fat for storage.</p>	<p>The body stores excess calories from all sources—protein, carbohydrate, and fat—as body fat.</p>



Nutrient Information	Protein	Carbohydrate	Fat
<p><b>Did You Know?</b></p>	<p>Protein is made of amino acids. Essential amino acids are ones the body cannot make and must have in the diet. Protein from animal foods supplies all the essential amino acids and is considered complete protein.</p> <p>Protein from plant sources lacks one or more of the essential amino acids and is considered incomplete protein. However, a mixed diet of plant and animal protein sources supplies all the amino acids needed for good health.</p> <p>Food combinations such as beans and rice, macaroni and cheese, or peanut butter and whole wheat bread are tasty ways to get all the amino acids in the diet.</p>	<p>All carbohydrates are made of different combinations of sugar units. Simple sugars, such as table sugar (sucrose) or the sugar in milk (lactose), have two sugar units linked together. The body can easily break the bond between the two sugar units. Simple sugars digest quickly and provide a quick energy source.</p> <p>The complex carbohydrate starch is made of many sugar units linked together. The body needs more time to break the bonds between the chains of sugar units. Starch digests more slowly and provides a sustained energy source.</p> <p>Carbohydrate (simple and complex) starts to digest in the mouth. The bacteria in the mouth eat the sugars and produce acid which contributes to tooth decay. Brushing teeth after meals and snacks helps prevent cavities.</p>	<p>Fat is made of fatty acids. Essential fatty acids are ones the body cannot make and must have in the diet.</p> <p>Fat is needed in small amounts for good health. Too much of any type of fat can contribute to weight gain and heart conditions.</p> <p>Fatty acids are liquid at room temperature. Food sources of these fats are recommended.</p> <p>Polyunsaturated fatty acids: Moderate intake of these fats is recommended.</p> <p>Saturated fatty acids and <i>trans</i> fatty acids are solid at room temperature. The <i>Dietary Guidelines</i> encourage lower intake of these types of fats. These can be hidden in processed foods, so remember to read the label.</p> <p>The <i>Dietary Guidelines</i> recommend limiting added fats; limiting solid fats; choosing lean, low-fat, and fat-free foods; and shifting sources of dietary fat to fish, nuts, and olive or canola oils.</p>







A Taste of Food and Fitness

**Lesson 4:**  
**Vitamins and Minerals**





## Vitamins

Fat-Soluble Vitamins			
Name	What It Does in the Body	Sources	Additional Notes
<b>Vitamin A</b>	<ul style="list-style-type: none"> <li>• Healthy skin</li> <li>• Healthy eyes and night vision</li> </ul>	<ul style="list-style-type: none"> <li>• Milk</li> <li>• Liver</li> <li>• Egg yolks</li> <li>• Dark green vegetables</li> <li>• Red/orange vegetables</li> </ul>	Taking too much vitamin A from supplements can damage health and cause the skin to appear yellow or orange.
<b>Vitamin D (aka sunshine vitamin)</b>	<ul style="list-style-type: none"> <li>• Helps the body absorb calcium</li> <li>• Contributes to strong bones and teeth</li> </ul>	<ul style="list-style-type: none"> <li>• Milk</li> <li>• Fatty fish</li> <li>• Liver</li> <li>• Eggs</li> </ul>	The body can produce vitamin D when skin is exposed to sunlight.
<b>Vitamin E</b>	<ul style="list-style-type: none"> <li>• Essential to red blood cell production</li> <li>• Helps keep cells healthy</li> </ul>	<ul style="list-style-type: none"> <li>• Vegetable oils</li> <li>• Wheat germ</li> <li>• Whole grains</li> <li>• Dark green leafy vegetables</li> <li>• Sesame seeds</li> <li>• Almonds</li> </ul>	Vitamin E is not a miracle cure for everything.
<b>Vitamin K</b>	<ul style="list-style-type: none"> <li>• Necessary for normal blood clotting</li> <li>• Plays a minor role in strong bones</li> </ul>	<ul style="list-style-type: none"> <li>• Dark green leafy vegetables</li> <li>• Milk</li> <li>• Vegetable oils</li> <li>• Cabbage</li> <li>• Cauliflower</li> </ul>	Newborn babies receive a vitamin K shot at birth to prevent hemorrhages.
Water-Soluble Vitamins			
<b>Thiamin</b>	<ul style="list-style-type: none"> <li>• Helps the body use energy</li> <li>• Keeps the nervous system healthy</li> </ul>	<ul style="list-style-type: none"> <li>• Whole and enriched grains</li> <li>• Pork</li> <li>• Eggs</li> <li>• Yeast</li> <li>• Dried beans</li> <li>• Dark green vegetables</li> </ul>	
<b>Riboflavin</b>	<ul style="list-style-type: none"> <li>• Essential to converting carbohydrate, fat, and protein to energy</li> <li>• The digestive tract, mucous membranes, and skin need riboflavin to be healthy</li> </ul>	<ul style="list-style-type: none"> <li>• Milk</li> <li>• Cheese</li> <li>• Whole and enriched grains</li> <li>• Organ meats</li> <li>• Eggs</li> <li>• Dark green vegetables</li> </ul>	
<b>Niacin</b>	<ul style="list-style-type: none"> <li>• Helps release energy from foods</li> <li>• Keeps the nervous system healthy</li> <li>• Promotes healthy skin</li> <li>• Promotes healthy digestive tract</li> </ul>	<ul style="list-style-type: none"> <li>• Pork</li> <li>• Beef</li> <li>• Whole or enriched grains</li> <li>• Peanuts</li> <li>• Liver</li> </ul>	

<b>Folate</b>	<ul style="list-style-type: none"> <li>• Helps make new body and blood cells</li> <li>• Helps prevent birth defects</li> <li>• May reduce heart disease</li> </ul>	<ul style="list-style-type: none"> <li>• Green vegetables</li> <li>• Citrus fruits</li> <li>• Strawberries</li> <li>• Dried beans</li> <li>• Enriched grains</li> <li>• Fortified cereals</li> <li>• Liver</li> <li>• Wheat germ</li> </ul>	
<b>Vitamin B12</b>	<ul style="list-style-type: none"> <li>• Aids in nerve function</li> <li>• Helps the body make new cells</li> </ul>	<ul style="list-style-type: none"> <li>• Meat</li> <li>• Poultry</li> <li>• Fish</li> <li>• Eggs</li> <li>• Milk</li> <li>• Fortified soymilk</li> </ul>	It is a nutrient of concern in strict vegetarian diets. Taking too much vitamin B12 from supplements can damage health.
<b>Pyridoxine (B6)</b>	<ul style="list-style-type: none"> <li>• Helps the body turn food into energy</li> <li>• Essential in the body's function of sugars, fats, and proteins</li> <li>• Helps the development of the brain, nerves, and skin</li> </ul>	<ul style="list-style-type: none"> <li>• Cereals</li> <li>• Beans</li> <li>• Vegetables</li> <li>• Liver</li> <li>• Meat</li> <li>• Eggs</li> </ul>	Mega doses of vitamin B6 may contribute to irreversible nerve damage. This vitamin must be obtained from food since the body cannot make it.
<b>Biotin</b>	<ul style="list-style-type: none"> <li>• Coenzyme component essential for the metabolism of carbohydrate, fat, and amino acids</li> <li>• Helps support and maintain a healthy nervous system</li> </ul>	<ul style="list-style-type: none"> <li>• Organ meats</li> <li>• Barley</li> <li>• Brewer's yeast</li> <li>• Fortified cereals</li> <li>• Corn</li> <li>• Eggs yolks</li> <li>• Milk</li> <li>• Soy</li> <li>• Wheat bran</li> <li>• Avocados</li> <li>• Broccoli</li> <li>• Cauliflower</li> <li>• Cheeses</li> <li>• Chicken</li> <li>• Fish</li> <li>• Legumes</li> <li>• Mushrooms</li> <li>• Nuts</li> <li>• Pork</li> <li>• Potatoes</li> <li>• Spinach</li> </ul>	



<b>Pantothenic acid</b>	<ul style="list-style-type: none"> <li>• Helps the body convert carbohydrate, fat, and protein to energy</li> </ul>	<ul style="list-style-type: none"> <li>• Avocados</li> <li>• Brewer's yeast</li> <li>• Cauliflower</li> <li>• Corn</li> <li>• Eggs yolks</li> <li>• Kale</li> <li>• Legumes</li> <li>• Lentils</li> <li>• Tomatoes</li> <li>• Organ meats</li> <li>• Turkey</li> <li>• Duck</li> <li>• Chicken</li> <li>• Sweet potatoes</li> <li>• Sunflower seeds</li> <li>• Whole grain breads and cereals</li> <li>• Wheat germ</li> <li>• Salmon</li> </ul>	
<b>Vitamin C</b>	<ul style="list-style-type: none"> <li>• Part of collagen</li> <li>• Helps immunity</li> <li>• Keeps gums healthy</li> <li>• Keeps blood vessels healthy</li> </ul>	<ul style="list-style-type: none"> <li>• Citrus fruits</li> <li>• Tomatoes</li> <li>• Peppers</li> <li>• Potatoes</li> <li>• Cantaloupe</li> <li>• Strawberries</li> <li>• Broccoli</li> <li>• Cabbage</li> </ul>	





## Minerals

Major			
Name	What It Does in the Body	Sources	Additional Notes
<b>Calcium</b>	<ul style="list-style-type: none"> <li>Building and maintaining strong bones</li> <li>Building and maintaining teeth</li> <li>Role in muscle contraction, nerve impulses, blood clotting, and normal blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>Milk</li> <li>Cheese</li> <li>Yogurt</li> <li>Dried beans</li> <li>Broccoli</li> <li>Fish with soft bones</li> <li>Dark green vegetables</li> </ul>	
<b>Phosphorus</b>	<ul style="list-style-type: none"> <li>Combined with calcium in the bones and teeth</li> <li>Essential for tissue growth and renewal</li> <li>Assists many enzymes and vitamins in extracting energy from nutrients</li> </ul>	<ul style="list-style-type: none"> <li>Cottage cheese</li> <li>Milk</li> <li>Navy beans (cooked)</li> <li>Salmon (canned)</li> <li>Sirloin steak</li> </ul>	
<b>Magnesium</b>	<ul style="list-style-type: none"> <li>Contributes to strong teeth</li> <li>Aids in the metabolism of potassium, calcium, and vitamin D</li> </ul>	<ul style="list-style-type: none"> <li>Whole grains</li> <li>Black beans</li> <li>Black-eyed peas</li> <li>Avocados</li> <li>Soymilk</li> </ul>	
<b>Sodium</b>	<ul style="list-style-type: none"> <li>Helps transmit nerve impulses</li> <li>Helps with muscle contraction and relaxation</li> <li>Helps to maintain the right balance of body fluids</li> </ul>	<ul style="list-style-type: none"> <li>Processed</li> <li>Prepared foods</li> <li>Vegetables</li> <li>Dairy products</li> <li>Meats</li> <li>Shellfish</li> </ul>	Also known as table salt is a combination of two minerals sodium and chloride. The <i>Dietary Guidelines</i> recommend that adults eat one teaspoon or less of salt per day.
<b>Potassium</b>	<ul style="list-style-type: none"> <li>Regulates heart beats</li> <li>Required for normal muscle function, and promotes normal blood pressure</li> </ul>	<ul style="list-style-type: none"> <li>Fresh fruits and vegetables</li> <li>Bananas</li> <li>Potatoes</li> <li>Lima beans</li> </ul>	
<b>Chloride</b>	<ul style="list-style-type: none"> <li>Plays an important role in the blood</li> </ul>	<ul style="list-style-type: none"> <li>Salt, both added and naturally occurring in foods</li> </ul>	It works with sodium to help maintain crucial fluid balances.
<b>Sulfate</b>	<ul style="list-style-type: none"> <li>Important in synthesizing sulfur-containing amino acids to help strands of protein maintain their shape</li> <li>Used to make protein for cells and tissues</li> </ul>	<ul style="list-style-type: none"> <li>Eggs</li> <li>Meat</li> <li>Poultry</li> <li>Fish</li> <li>Legumes and dried beans</li> <li>Dairy</li> </ul>	It is oxidized sulfur as it occurs in food and water.



Trace			
<b>Iodine</b>	<ul style="list-style-type: none"> <li>Allows cells to convert food to energy</li> <li>Needed in the thyroid gland to produce thyroid hormones which control the body's metabolism</li> </ul>	<ul style="list-style-type: none"> <li>Iodized salt</li> <li>Seafood such as cod, sea bass, haddock, and perch</li> <li>Kelp</li> <li>Dairy products</li> </ul>	Found naturally in the body. Crucial nutrient
<b>Iron</b>	<ul style="list-style-type: none"> <li>Prevents anemia</li> <li>Carries oxygen in red blood cells</li> <li>Boosts the immune system</li> </ul>	<ul style="list-style-type: none"> <li>Lean red meats</li> <li>Organ meats</li> <li>Dark poultry meats</li> <li>Whole and enriched grains</li> <li>Legumes</li> <li>Dark green vegetables</li> </ul>	Considered the body's gold
<b>Zinc</b>	Critical role in <ul style="list-style-type: none"> <li>Immune function</li> <li>Wound healing</li> <li>Growth</li> <li>Blood clotting</li> </ul>	<ul style="list-style-type: none"> <li>Lean meat</li> <li>Eggs</li> <li>Seafood</li> <li>Nuts</li> <li>Whole grains</li> </ul>	
<b>Selenium</b>	<ul style="list-style-type: none"> <li>An antioxidant that helps to fight damaging particles in the body known as free radicals</li> </ul>	<ul style="list-style-type: none"> <li>Brazil nuts</li> <li>Yellowfin tuna</li> <li>Halibut</li> <li>Sardines</li> <li>Grass-fed beef</li> <li>Turkey</li> <li>Beef liver</li> <li>Chicken</li> </ul>	
<b>Fluoride</b>	<ul style="list-style-type: none"> <li>Helps to reduce tooth decay</li> </ul>	<ul style="list-style-type: none"> <li>Naturally found in the food and water we consume</li> <li>Fluoridated toothpastes</li> <li>Some dietary supplements</li> </ul>	Occurs naturally in the body as calcium fluoride and is mostly found in the bones and teeth.
<b>Chromium</b>	<ul style="list-style-type: none"> <li>Essential mineral that helps in the metabolism of carbohydrate and fat</li> <li>May help maintain glucose homeostasis by activating the hormone insulin and improving cell absorption of glucose</li> </ul>	<ul style="list-style-type: none"> <li>Meat</li> <li>Unrefined grains</li> <li>Vegetable oils</li> </ul>	
<b>Copper</b>	<ul style="list-style-type: none"> <li>Helps in the function of muscles</li> <li>Helps in the function of the immune system</li> <li>Helps in the function of the nervous system</li> </ul>	<ul style="list-style-type: none"> <li>Whole grains</li> <li>Beans</li> <li>Nuts</li> <li>Shellfish</li> <li>Organ meats</li> <li>Potatoes</li> <li>Dark leafy greens</li> <li>Dried fruit</li> <li>Cocoa</li> <li>Black pepper</li> </ul>	Essential trace mineral because it is present in all body tissue. Copper works with iron in the formation of red blood cells.



## Fluid Facts About Water

Do you know which nutrient your body needs most? It is water. Water is so critical that without fluids, a person will not survive. A person can live without food for a few weeks, but cannot live more than a few days without water.

Water is part of every cell in the body. It plays a role in nearly every body process. Water works to promote health by

- Transporting nutrients to the cells
- Removing waste products from the cells and the body
- Lubricating joints
- Cooling the body through perspiration
- Moistening the eyes, mouth, and nasal passages
- Aiding in digestion as part of saliva and digestive juices

Exactly how much water or fluids a person needs each day varies. Physical activities and hot weather or conditions increase fluid needs. Thirst, the desire to drink fluids, is your body's cue that it needs more fluids. Obey your thirst and consume fluids with and between meals.

Fluid studies indicate water and other beverages provide most of the fluids in the diet. Foods provide about 20% of daily fluids. A combination of foods and beverages can meet a person's needs. Meet your fluid needs with

- water
- milk
- soups
- fruits
- vegetables
- juice
- other beverages

Medical professionals encourage plain water and unsweetened beverages for a variety of reasons. Tooth decay can occur with frequent intake of regular soft drinks, sports drinks, fruit punches, and other sugary drinks. Sugar sweetened beverages are a source of extra calories and may contribute to weight gain. Coffee and tea provide fluids; however, be sure daily fluid choices are varied. The concepts of balance, variety, and moderation apply to both daily food and beverage choices.

It is common to see water bottles carried by young and old alike. Here is a tip to keep your drink refreshing and safe. Use a durable water bottle designed to be reused. Thoroughly clean reusable water bottles with a bottlebrush and hot, soapy water between uses. Wash bottles with large openings in a dishwasher if the bottle is made of dishwasher-safe materials. Refilling a water bottle without a thorough washing creates a perfect place for bacteria to grow. Keep your water fresh and clean.





## Nutrition Nuggets: Phytochemicals

Phytochemicals are plant-based (phyto) nutrients. Nature packs fruits and vegetables with vitamins, minerals, and phytochemicals. They are not vitamins or minerals. They are bioactive food components that provide health benefits beyond basic nutrition. Scientists are starting to uncover all of the powerful, health-promoting compounds in plant foods.

**Phytochemicals help provide the color of fruits and vegetables.** Produce with similar hues may promote health in similar ways. How do phytochemicals work? Though science does not have all the answers, there is strong promise of added health benefits of vegetables and fruits beyond the known actions of vitamins and minerals. That is reason enough to say super-size the next colorful, delicious salad.

Phytochemical	Proposed Benefits	Food Sources	Colorful Facts
<b>Allicin</b>	<ul style="list-style-type: none"> <li>• Lower total cholesterol and triglycerides</li> <li>• Increase HDL cholesterol</li> <li>• May reduce ulcers</li> </ul>	<ul style="list-style-type: none"> <li>• Onions</li> <li>• Leeks</li> <li>• Garlic</li> <li>• Chives</li> </ul>	White/green foods
<b>Beta-Carotene</b>	<ul style="list-style-type: none"> <li>• Immune System</li> <li>• Vision</li> <li>• Skin Health</li> <li>• Bone Health</li> </ul>	<ul style="list-style-type: none"> <li>• Pumpkin</li> <li>• Sweet Potato</li> <li>• Carrots</li> <li>• Winter Squash</li> <li>• Cantaloupe</li> <li>• Apricots</li> <li>• Spinach</li> <li>• Collard Greens</li> <li>• Kale</li> <li>• Broccoli</li> </ul>	Orange and dark, leafy green vegetables
<b>Lycopene</b>	<ul style="list-style-type: none"> <li>• Cancer (Prostate)</li> <li>• Heart Health</li> </ul>	<ul style="list-style-type: none"> <li>• Tomatoes</li> <li>• Pink Grapefruit</li> <li>• Red Peppers</li> <li>• Watermelon</li> <li>• Tomato Products</li> </ul>	<p>Red plant foods are rich in lycopene</p> <p>The heating process makes lycopene easier for the body to absorb</p>
<b>Lutein</b>	<ul style="list-style-type: none"> <li>• Eye Health</li> <li>• Cancer</li> <li>• Heart Health</li> </ul>	<ul style="list-style-type: none"> <li>• Collard Greens</li> <li>• Kale</li> <li>• Spinach</li> <li>• Broccoli</li> <li>• Brussels Sprouts</li> <li>• Lettuces</li> <li>• Artichokes</li> <li>• Corn</li> <li>• Orange Peppers</li> <li>• Kiwi</li> <li>• Grapes</li> <li>• Zucchini</li> <li>• Squash</li> </ul>	Egg yolks are the rare animal food rich in lutein

<b>Resveratrol</b>	<ul style="list-style-type: none"> <li>• Heart Health</li> <li>• Cancer</li> <li>• Lung Health</li> <li>• Inflammation</li> </ul>	<ul style="list-style-type: none"> <li>• Red Wine</li> <li>• Peanuts</li> <li>• Grapes</li> </ul>	1 cup of red grapes can have up to 1.25mg of resveratrol
<b>Anthocyanidins</b>	<ul style="list-style-type: none"> <li>• Blood Vessel Health</li> <li>• May prevent age-related memory loss</li> </ul>	<ul style="list-style-type: none"> <li>• Blueberries</li> <li>• Blackberries</li> <li>• Plums</li> <li>• Cranberries</li> <li>• Raspberries</li> <li>• Red Onions</li> <li>• Red Potatoes</li> <li>• Red Radishes</li> <li>• Strawberries</li> </ul>	Red and purple berries
<b>Isoflavones</b>	<ul style="list-style-type: none"> <li>• Menopause</li> <li>• Cancer (Breast)</li> <li>• Bone health</li> <li>• Joint Inflammation</li> <li>• Lower Cholesterol</li> </ul>	<ul style="list-style-type: none"> <li>• Soybeans</li> </ul>	1/2 cup boiled soybeans offers 47mg of isoflavones

Source: <https://www.fruitsandveggiesmorematters.org/what-are-phytochemicals>



## Cafeteria Connection: Pumping Up Performance

Pumping iron - dietary sources of iron is a powerful tool to help students be successful in school.

Do you know how poor iron intake can influence a student's ability to learn? The potential side effects of iron deficiency, also known as iron deficient anemia, include

- Increased tiredness
- Shortened attention span
- Decreased capacity to work
- Less resistance to illness
- Impaired ability to think and problem solve

One or more of these symptoms can add up to a student who is unable to learn and perform at their best.

Low iron status is a common health concern for teenage girls. Many girls do not eat enough of the richest sources of iron, including red meat, liver, whole and enriched grains, and fortified cereals. Vegetarian students may also be at higher risk for poor iron intake. Well-planned vegetarian meals can provide nutrient needs, including iron. However, some youth become vegetarian without learning to plan nutritious meals. They often skip iron-rich dried beans, peas, lentils, and whole grains, and do not often eat vitamin C-rich foods that increase the absorption of iron from plant foods.

Schools meals are planned to provide a balance of vitamins and minerals. These nutrients do more than support growth and development. Vitamins and minerals enhance the immune system, which helps students have less absences due to illness. Good nutrition also provides the brain with critical nutrients needed for learning. Encouraging fruit and vegetable intake is one way to increase vitamins and minerals in an eating pattern.

## What's for Lunch?

**Instructions:** Using the two handouts Vitamins and Minerals, compare the following two menus. Which menu provides the most vitamins and minerals? Determine the vitamins and minerals that can be found in the food items in each menu and list them in the charts.

### Menu 1

Whole Wheat Chicken Nuggets  
Sweet Potatoes  
Green Beans  
Apple  
Milk

Food Item	Vitamins and Minerals

### Menu 2

Chef Salad – Turkey, Ham,  
and Cheese  
Romaine Lettuce  
Baby Spinach  
Shredded Carrots  
Cucumbers  
Tomatoes  
Mandarin Oranges  
Whole Wheat Breadsticks  
Milk

Food Item	Vitamins and Minerals





## Resource:

### Websites of Organizations: Fruit and Vegetables Group

These organizations offer nutrition information and recipes featuring a variety of fruits and vegetables. Look for consumer and school food service information.

#### FRUITS

Apricot Producers of California  
[www.apricotproducers.com](http://www.apricotproducers.com)

California Cling Peach Board  
[www.calclingpeach.com](http://www.calclingpeach.com)

California Dried Plum Board  
[www.californiadriedplums.org](http://www.californiadriedplums.org)

California Kiwifruit Commission  
[www.kiwifruit.org](http://www.kiwifruit.org)

California Raisin Marketing Board  
[www.raisins.org](http://www.raisins.org)

California Table Grape Commission  
[www.tablegrape.com](http://www.tablegrape.com)

Cherry Marketing Institute  
[www.choosecherries.com](http://www.choosecherries.com)

Florida Department of Citrus  
<http://www.floridacitrus.org/oj/>

International Banana Association  
<http://www.thepacker.com/>

National Watermelon Promotion Board  
[www.watermelon.org](http://www.watermelon.org)

New England Apple Association  
[www.newenglandapples.org](http://www.newenglandapples.org)

Northwest Cherry Growers  
[www.nwcherries.com](http://www.nwcherries.com)

Oregon Raspberry and Blackberry Commission  
[www.oregon-berries.com](http://www.oregon-berries.com)

U.S. Apple Association  
[www.usapple.org](http://www.usapple.org)

U.S. Highbush Blueberry Council  
[www.blueberry.org](http://www.blueberry.org)

Washington State Apple Commission  
[www.bestapples.com](http://www.bestapples.com)

#### VEGETABLES

California Tomato Grower's Association, Inc.  
[www.ctga.org/](http://www.ctga.org/)

Florida Tomato Committee  
[www.floridatomatoes.org](http://www.floridatomatoes.org)

Mushroom Council  
[www.mushroominfo.com/](http://www.mushroominfo.com/)

National Onion Association  
[www.onions-usa.org](http://www.onions-usa.org)

National Potato Promotion Board  
[www.healthypotato.com](http://www.healthypotato.com)

#### PRODUCE ORGANIZATIONS

Produce for Better Health Foundation  
[www.pbhfoundation.org/](http://www.pbhfoundation.org/)

Produce Marketing Association  
[www.pma.com](http://www.pma.com)

United Fresh Produce Association  
[www.unitedfresh.org](http://www.unitedfresh.org)





A Taste of Food and Fitness

**Lesson 5:**  
**Alternate Eating Patterns**





## Cafeteria Connection: Vegetarian Eating Patterns

The term “vegetarian” can mean different things to different people. For some, it may mean not eating meat. For others, it can mean eating only certain plant foods. For yet others, it means something in between.

The most common vegetarian eating patterns in the United States are

- Lacto-ovo
- Lacto
- Ovo
- Vegan

**Lacto-ovo vegetarians** eat plant-based foods plus milk/dairy products (lacto) and eggs (Ovo). Lacto-ovo vegetarian meal patterns are the least likely to have nutrient deficiencies because a few animal foods are included.

**Lacto vegetarians** eat plant-based foods and milk/dairy products.

**Ovo vegetarians** eat plant-based foods and eggs.

**Vegans** do not eat any animal-based foods. Strict vegans also avoid honey and foods derived from animal products such as gelatin. Vegans need to pay careful attention to sources of complete proteins in their diets.

### Less Common Varieties

**Flexitarian** is a flexible vegetarian. This person may eat chicken, fish, or even red meat on occasion, but generally follows a plant-based diet.

**Fruitarians** eat fruits, nuts, and seeds. They usually avoid grains, legumes, and vegetables that are not the fruit of the plant. This subtype of the vegan meal pattern can lead to nutrient deficiencies.

**Macrobiotic meal patterns** are plant-based, though some people include fish. Most macrobiotic meal patterns feature whole grains, vegetables, and legumes with fewer fruits, nuts, and seeds.

**Raw food meal patterns** are often plant-based. Uncooked and unprocessed foods are the basis of a raw food meal plan. Some people include raw meat or fish and raw milk.

**Semi-vegetarians** may follow a self-styled eating plan rather than a defined vegetarian eating pattern. These people may describe themselves as vegetarian, yet eat fish (**pescatarian**) or poultry.

The key to a healthy vegetarian eating pattern is to eat a variety of foods. The more restrictive your diet is, the greater the risk of missing essential nutrients. With proper planning, you can live a very healthy life following a plant-based eating pattern.

School nutrition professionals can choose one of two tools to help meet the needs of students who prefer vegetarian meals: Offer Versus Serve and creative menu planning.

### **Offer Versus Serve (OVS)**

Offer Versus Serve (OVS) meal service is designed to reduce food waste and costs. High schools are required to give students the option of Offer Versus Serve at lunch, unless the school district has demonstrated to the State agency that their system does not accommodate OVS. Offer Versus Serve is often extended to students at lower grade levels.

- OVS allows students to decline a food they do not want and still have a reimbursable meal.
- OVS gives the students choices. Those choices can include vegetarian options.

An example of OVS would be

- If the menu planner identifies the entrée with options, such as a taco with beans or taco with meat and beans, the student can choose the option they want to eat.

### **Creative Menu Planning**

School nutrition programs can meet the needs of students who prefer vegetarian meal patterns. When a choice of entrées is provided, offer a choice for vegetarians. It will help all students meet the *Dietary Guidelines for Americans*.

Other menu items can follow these examples. Offer a main dish salad that allows a choice of two protein foods: beans, turkey chunks, shredded cheese, chopped egg, or nuts. Two of these items on a colorful, fresh salad with a whole grain bread stick and milk would meet the needs of all vegetarians. Students may decline milk if they follow a vegan eating style. A nutritional equivalent to milk can be made available as an option for students to choose.



## Nutrients to Focus on in Plant-Based Eating Patterns

Nutrient	Concern
<b>Protein</b>	Animal proteins are complete because they provide all essential amino acids. Plant proteins are incomplete because different plant foods lack different amino acids with the exception of soy and quinoa. Vegan diets that include whole grains, legumes, nuts, and seeds can provide both adequate protein quantity and quality. Complementary proteins do not need to be eaten at every meal and snack, but rather throughout the day. In order for protein needs to be met, vegetarian meal patterns must provide adequate calories.
<b>Iron</b>	Meat provides heme iron, which is highly absorbed and used by the body. Plant foods provide non-heme iron. The absorption of non-heme iron is increased when it is eaten with food rich in vitamin C, for example spinach salad with orange segments. Iron-fortified cereals and grains, legumes, and leafy greens are good sources of iron in plant-based meal patterns.
<b>Calcium</b>	Plant-based meal patterns that include enough milk and milk products will supply calcium needs. Vegetarians who do not include milk or milk products need to choose legumes, leafy green vegetables, and calcium-fortified milk replacements such as calcium-fortified soymilk.
<b>Vitamin B12</b>	Only animal foods provide vitamin B12. Strict vegans need to include vitamin B12 fortified foods or supplements in order to have adequate intake. Plant-based meal patterns are rich in the B vitamin folate, which can mask the symptoms of B12 deficiency.
<b>Vitamin D</b>	Vegetarians who do not have enough sun exposure may need a vitamin D supplement or vitamin D-fortified foods.
<b>Omega-3 Fatty Acids</b>	The omega-3 fatty acids in fish and seafood, DHA and EPA, are often low in the diets of strict vegans. Microalgae can be a source of DHA for vegetarians. The body can change DHA into EPA. Consider fortified products or possibly a supplement.
<b>Zinc</b>	Plant-based foods are low in zinc. The high phytate content of plant-based diets may further reduce absorption rates. Unrefined grains and legumes have phytate. Phytate binds with zinc.
<b>Iodine</b>	Plant foods are also low in iodine. Unless iodized salt is used, plant-based eating patterns can be low in this nutrient.



## Complete Proteins

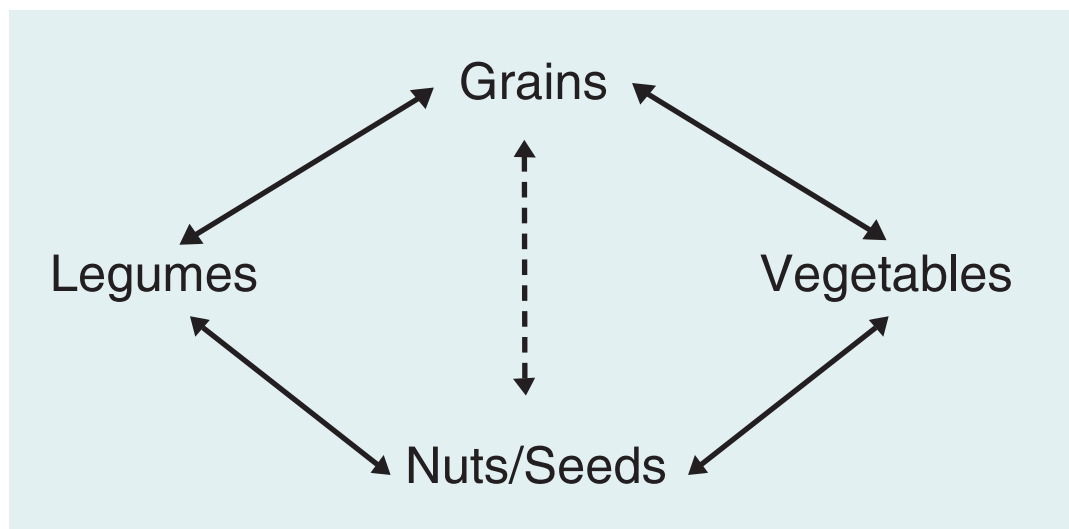
When vegetarian diets gained popularity in the 1960s and 1970s, the advice was to make sure complete proteins were eaten at each meal.

Proteins are complete when they provide all the essential amino acids. Amino acids are the building blocks of protein. Animal proteins are complete.

If an essential amino acid is lacking, the protein is incomplete. Most plant-based proteins are low in one of the essential amino acids. Plant-based proteins are limited by that amino acid and are considered incomplete. For example, if the only source of protein in a meal was corn, a lysine deficiency would occur.

Grains, nuts, and seeds are limited by the amino acid lysine; vegetables and legumes are limited by the amino acid methionine.

The chart below shows how different plant foods with incomplete proteins can combine to form complete proteins. The solid line between two foods means most foods in the two groups can combine to provide complete protein. The dotted line between grains and nuts and seeds means some but not all foods in the two groups will combine to provide complete protein. When two foods combine to create a complete protein, the foods are called complementary.



Nutrition science has advanced since the early 1960s. Today's advice for vegetarians is to eat a variety of plant-based protein sources throughout the day for complete proteins. A healthy vegetarian eating pattern does not need to have complete proteins at each meal. However, complementary proteins are delicious and make menu planning easier. Vegetarian meals can provide adequate protein quality as well as quantity.



## Nutrition Nuggets: Health and Nutrition Benefits in Plant-Based Eating Patterns

Nutrient/Diet Component	Health Connection
<b>Dietary Fiber</b>	<ul style="list-style-type: none"> <li>• Higher in vegetarian diets, dietary fiber is associated with healthy body weight.</li> <li>• Lower body weight is linked to lower risk of chronic diseases.</li> </ul>
<b>Soluble Fiber</b>	<ul style="list-style-type: none"> <li>• Helps lower blood cholesterol</li> <li>• Helps keep blood sugar levels stable</li> </ul>
<b>Insoluble Fiber</b>	<ul style="list-style-type: none"> <li>• Speeds food through the digestive tract, which may lower risk of some cancers</li> </ul>
<b>Soy Protein</b>	<ul style="list-style-type: none"> <li>• Helps reduce blood cholesterol</li> <li>• Linked to lower risk of Type 2 diabetes</li> </ul>
<b>Fruits and Vegetables</b>	<ul style="list-style-type: none"> <li>• Rich in minerals such as potassium</li> <li>• Rich in antioxidants and phytochemicals</li> <li>• Helps reduce blood pressure</li> <li>• Helps reduce heart disease risk</li> <li>• Helps fight cancer cells in early stages</li> </ul>
<b>Legumes</b>	<ul style="list-style-type: none"> <li>• Helps lower blood cholesterol</li> <li>• Helps keep blood sugar levels stable</li> </ul>
<b>Whole Grains</b>	<ul style="list-style-type: none"> <li>• Rich in vitamins, minerals, and dietary fiber</li> <li>• Linked to lower risk of Type 2 diabetes</li> </ul>
<b>Nuts</b>	<ul style="list-style-type: none"> <li>• Helps lower blood cholesterol</li> </ul>
<b>Mono-and Polyunsaturated Fats</b>	<ul style="list-style-type: none"> <li>• Helps lower blood cholesterol, help reduce inflammation</li> </ul>

How well a plant-based meal pattern meets nutrition needs depends on some important factors. One is the type of plant-based meal eaten. Another is if the plant-based meal is well-planned and balanced.

Like any other pattern of eating, consuming a variety of foods helps to ensure that all nutrients needs are met.





## Myth Busters: Gluten Allergy, Intolerance, and Celiac Disease

Some people experience digestive problems due to eating wheat products. What causes the digestive problems? There are three medical conditions that can explain these problems: wheat allergy, non-celiac gluten sensitivity or intolerance, and celiac disease. Gluten is a protein in wheat, barley, and rye. The following are some myths you may have heard concerning gluten allergy, intolerances, and celiac disease.

### **Myth #1: Gluten is bad for you.**

Gluten is not bad, its unique protein structure makes it difficult for the body to digest. It is fine for people who do not experience digestive problems when consuming products made with gluten. Those with a gluten allergy may be able to tolerate a small amount of gluten. Someone with a gluten intolerance may experience the same symptoms as someone with celiac disease. When gluten is removed from their eating pattern, the symptoms go away. If a person has been diagnosed with celiac disease they must be put on a strict gluten-free meal pattern.

### **Myth #2: There is no such thing as a gluten intolerance.**

A gluten intolerance may be referred to as a non-celiac gluten sensitivity (NGCS) or non-celiac wheat sensitivity (NCWS). Some people with a gluten intolerance can experience depression, headaches, diarrhea, chronic fatigue, bone or joint pain, or abdominal pains to name a few. A person with a gluten intolerance may not only have these symptom, they could experience intestinal damage.

### **Myth #3: I cannot eat bread because I am allergic to gluten.**

Dr. David Stukus an allergist at the Nationwide Children's Hospital and assistant professor of pediatrics at Ohio State University stated at the annual meeting of the American College of Allergy, Asthma, & Immunology that gluten allergy is not recognized. However, wheat is a recognized allergy. People misdiagnose themselves with the gluten allergy when their condition is something else.

### **Myth #4: I have celiac disease but a small amount of gluten will not hurt me.**

For someone with celiac disease even the smallest amount of gluten is harmful. A person with celiac disease must be on a strict gluten-free meal pattern.

### **Myth #5: You cannot be overweight and have celiac disease.**

It does not matter if you are underweight or overweight, anyone can have celiac disease.

**Myth #6: A person with celiac disease can take a gluten-digesting aid before a meal and it is ok to eat a wheat product containing gluten.**

A person with celiac disease must be on a gluten-free meal pattern. There are products on the market that can aid in digesting gluten. However, these products are supplements meant to be taken along with a gluten-free meal pattern.

**Myth #7: Once a person has an allergy, they will never outgrow that allergy.**

Anyone can outgrow allergies and develop new allergies. More than half the children with a wheat allergy will outgrow it before becoming an adult.

**Myth #8: If a person is allergic to wheat, they also have celiac disease.**

A person who is allergic to wheat or has a gluten sensitivity does not necessarily have celiac disease. If a person thinks they have celiac disease, they must consult a state licensed healthcare provider and be tested.

**Myth #9: If I think I have celiac disease, I should stop eating products with gluten.**

To confirm that a person has celiac disease, they must be tested. If that person stops consuming products with gluten without being tested, it could be that they do not have celiac disease but something else entirely. By not getting tested the problem could develop into something more serious.



A Taste of Food and Fitness

**Lesson 6:**  
**Putting it All Together**





## Time Saving Tips

- Jump start the cooking process. Batch cook and freeze portions of ingredients that take longer to cook, such as brown rice, or entrées, such as vegetable lasagna, for use later in the week.
- Packaging small portions of stews or soups can also be frozen or refrigerated for use at a later time.
- Prepack balanced meals from leftovers and store in microwave dishes in your freezer or refrigerator.
- Keep cut up vegetables in the refrigerator for that late afternoon snack or a quick snack on the go.
- Keep easy to eat, washed, whole fruit in the refrigerator for a quick sweet snack, such as grapes or kiwi (it can be eaten like an apple, skin and all).
- Purchase a variety of plain frozen vegetables to add color and nutrients to a quick meal or canned soup. These are high in nutrition and low in sodium and fat.
- Add your own tips:

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## Eating Better on a Budget

- Use a shopping list to limit purchases to items needed. Avoid impulse purchases by following a menu plan and not shopping while hungry.
- Concentrate shopping in the perimeter areas of the store, where fresh produce, milk, fish, poultry, meats, and breads are stocked. Limit processed food purchases.
- Compare unit prices and purchase the best value between foods. The biggest container is not always the best price.
- Purchase fruits and vegetables in season.
- Split the cost and the quantity of foods from bulk food outlets or warehouse stores with a friend or family member. Large packs are only a good deal if you can use the item before it spoils.
- Use coupons found in your local newspaper, in the store, and on the internet. Check pricing before purchasing to make sure it is a good deal.
- Watch for store sales on foods you use regularly. Purchase fruits, vegetables, and proteins that are on the weekly special.



## Factors That Influence Food Choices

**Instructions:** Discuss, at your table, the challenges/problems you face at school or at home concerning time, availability, price, and taste and record them on the following chart. The following are some questions you might ask: How has time impacted the food choices and preparation of the food? What are the challenges you have encountered with the availability of certain foods? How can you make price work for better nutrition choices? What strategies do you use to make the most of your food and nutrition dollar? When you have listed the challenges/problems, brainstorm to develop some possible solutions to overcome the challenges.

Challenges/Problems	Possible Solutions
<b>Time</b>	
<b>Availability</b>	
<b>Price</b>	
<b>Taste</b>	

## Cafeteria Connection: Tap Into the Power of Taste

Taste is a major factor in students' choices for meals. For school meals to deliver nutrition, students must choose and eat the foods offered. One method to increase students' demand for foods is to find out what tastes students prefer. Another method is to introduce students to new foods and create demand for new tastes. Both approaches can produce winning results for school nutrition programs.

Offer school meals that appeal to students' taste preferences. Conduct surveys to find out what students like. Collect ideas for new menu options. If the new ideas need makeovers to meet the nutrition requirements of school meals, check with colleagues for recipes and distributors for new food items.

Tap into the power of taste to increase students' demands for menu items. A variety of approaches can yield major results.

- You can organize a student advisory council to serve as a taste panel. Ask a student group that already exists, such as the student body officers or a service club, or gather a new group of students. Have the students taste test menu items, both new options and old favorites, and give feedback. Ask these students to poll other students for new menu ideas.
- Teachers are great partners. Talk to teachers and plan ways to take new tastes to the classroom.
  - Try different colors of fruits and vegetables in primary grades and art classes.
  - Taste ethnic foods featuring whole grains in classes studying different parts of the world and different cultures.
  - Conduct mock elections for new menu candidates with grades studying U.S. history and democracy. Use a taste and vote ballot.

Make the cafeteria a “new tastes” training ground. Give students a chance to try new foods. They may respond with enthusiasm to new choices; everyone likes a change of pace.

- Market new menu items. Provide bite-size samples of new menu options on the serving line. Let students know when the new food will be served as part of lunch.
- Provide “just a taste” opportunities. Younger students may only select familiar foods at school meals. The chance to have just a taste of an unfamiliar food may encourage children to make different choices.
- Partner with common interest groups. PTO/PTA groups, local nutrition and health organizations, and food companies may be able to help.
- Connect with the classroom and conduct a Plan a Meal activity. Students may give great new taste ideas for the menu.



## Nutrition Nuggets: Enhancing Flavors

Put natural taste interactions to work for you. Use the tips below to enhance the tastes you prefer in foods.

Put fresh or bottled lemon juice on mixed salad greens that have been drizzled with olive oil. The sour in the juice suppresses the bitter in salad greens and reds, like radicchio. A dash of salt will further suppress the bitter flavor.

Try a little lemon or lime juice just before serving on nearly any cooked vegetable with a bitter taste such as broccoli or Brussels sprouts. Once again, the sour of the fresh juice suppresses the bitter flavors.

Lightly sprinkle a strong-flavored cheese such as Parmesan or Romano on cooked vegetables. The salt from the cheese will suppress the bitter in the vegetable. A strong-flavored cheese imparts a big flavor with a little bit of cheese. Mix a strong-flavored cheese with a low-fat cheese such as shredded mozzarella for a generous sprinkle that is lower in calories. Remember though, these cheeses add sodium.

Top a sour fruit such as grapefruit segments with a sweet fruit such as finely diced, sweetened dried cranberries. The sweet from the cranberries will touch the tongue first and decrease the sour of the grapefruit. The color combination is pretty, too.

Black pepper on the top of a food item will suppress the taste of salt. When watching your salt and sodium intake, make sure the use of pepper does not increase your salt shakings. Red pepper does not suppress the perception of salt.

Use temperature for maximum taste advantage. A grapefruit half that is broiled or warmed slightly in a microwave will taste sweeter than cold grapefruit.

Enhance the natural sweetness of foods by using spices such as cinnamon, cardamom, ginger, or nutmeg. These spices, along with vanilla, enhance sweet flavors. Experiment with these spices in vegetable dishes. The taste sensation may surprise you.

Experience the flavor that fresh herbs can bring to salads and cooked dishes. Most cookbooks have a chart of common herb and food combinations. Read the labels of fresh herbs in the store for more ideas.

Create your own savory foods by using slow-cooking methods that naturally create wonderful flavor profiles. Caramelized onions, homemade chicken stock, and slow roasted foods have time to develop savory flavors. Compare the tastes of homemade applesauce, which has been slowly simmered, to the taste of canned. The taste may bring you back to homemade more often.

Toasting is a simple way to enhance the flavors of nuts and seeds. Toasting brings out the flavor of nuts. Add a tablespoon or two of toasted nuts or seeds to the top of yogurt and fruit, a colorful vegetable salad, barley and brown rice pilaf, or cooked oatmeal several times a week.



## Personal Discovery Assessment

**Instructions:** Answer the following questions.

What did you learn about your eating and activity habits?

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What is one change you want to make after completing this activity?

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### Make a plan for change

I plan to:

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I will do this by:

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If this plan does not work, I will try:

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## Personal Discovery Assessment

Use the form below to record daily food intake. Put a check mark under the food group to track servings. If desired, record calories and total each day. Track your amount of physical activity; try to have at least 30 minutes most days of the week. It can take 3 – 4 weeks to change a habit. Keep a daily record to help you chart your progress.

Time/M meal	Food	Amount	Calories	Grains	Vegetables	Fruits	Dairy	Protein	Oils	Activity
Example 7:00 a.m.	Bran Muffin	2 ounces	220	✓✓						



## Portion Distortion

Commonly purchased, served, and consumed portions of food have changed over the past few decades. The portions have grown and the calories have increased.



12 Oz. can



20 Oz. can

110 more calories

Regular  
SliceSuper  
Slice

350 more calories



1.5"



3.5"

220 more calories



3" Dia.



6" Dia.

210 more calories



1.5 Oz.



4 Oz.

290 more calories



1.5 Cups



3.5 Cups

400 more calories



2.4 Oz .



6.9 Oz.

400 more calories



Regular



Double

257 more calories







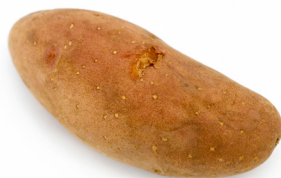
## Be a Portion Pro

Portion size is getting out of control these days. Here are serving sizes typically dished up today compared with the size you should be eating. How do your meals size up?

### Typical Size

### Ideal Size

Potato



Computer Mouse

Apple  
or piece of fruit



Tennis Ball

Meat



Deck Cards

Cheese



Dice

Bagel or  
Doughnut



Hockey Puck





## Tips for Eating Healthy When Eating out

- As a beverage choice, ask for water or order fat-free or low-fat milk, unsweetened tea, or other drinks without added sugars.
- Ask for whole wheat bread for sandwiches.
- In a restaurant, start your meal with a salad packed with veggies, to help control hunger and feel satisfied sooner.
- Ask for salad dressing to be served on the side. Then use only as much as you want.
- Choose main dishes that include vegetables, such as stir fries, kebobs, or pasta with a tomato sauce.
- Order steamed, grilled, or broiled dishes instead of those that are fried or sautéed.
- Choose a “small” or “medium” portion. This includes main dishes, side dishes, and beverages.
- Order an item from the menu instead heading for the all-you-can-eat buffet.
- If main portions at a restaurant are larger than you want, try one of these strategies to keep from overeating:
  - Order an appetizer-sized portion or a side dish instead of an entrée.
  - Share a main dish with a friend.
  - If you can chill the extra food right away, take leftovers home in a “doggy bag.”
  - When your food is delivered, set aside or pack half of it to go immediately.
  - Resign from the “clean your plate club”-when you’ve eaten enough, leave the rest.
- To keep your meal moderate in calories, fat, and sugars:
  - Ask for salad dressing to be served on the side so you can add only as much as you want.
  - Order foods that do not have creamy sauces or gravies
  - Add little or no butter to your food.
  - Choose fruits for dessert most often.
- On long commutes or shopping trips, pack some fresh fruit, cut-up vegetables, low-fat string cheese sticks, or a handful of unsalted nuts to help you avoid stopping for sweet or fatty snacks.

Adapted from <http://www.choosemyplate.gov/healthy-eating-tips/tips-for-eating-out.html>





## My Eating Habits

For 3 days, keep track of the food and meals you eat. Fill out the worksheet below and answer the questions on the next page, recording the day and time, foods eaten, anyone who shared the meal, emotions or feelings, and any other activities done while eating, such as watching TV.

Rate your taste awareness of the foods using this scale: 1 = did not notice flavors to 5 = paid complete attention to each flavor tasted.

Rate your level of hunger before and after eating using this scale: 1 = famished to 5 = uncomfortably overstuffed.

Review the sample below for an example of how to complete the form.

Day/Time	Food	With Whom	Where	Eating and Doing	Feeling Emotions	Taste Awareness	Hunger Level Before Food	Hunger Level After Food
Mon. 6:30 am	Oatmeal with Milk Blueberries Coffee	Husband	Kitchen Bar	Scanning newspaper	Feeling rushed	3	1	3

How often did you

- Eat while doing another activity? \_\_\_\_\_
- Eat not noticing the food flavors? \_\_\_\_\_
- Eat fully noticing the food flavors? \_\_\_\_\_
- Eat when very hungry? \_\_\_\_\_
- Eat when not very hungry? \_\_\_\_\_
- Stop eating before feeling full? \_\_\_\_\_
- Stop eating when pleasantly full? \_\_\_\_\_
- Stop eating when overly full? \_\_\_\_\_

Were you more mindful when eating because you were filling out this form?

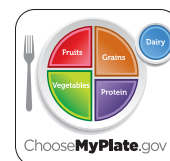
Yes \_\_\_\_\_ No \_\_\_\_\_

Did you learn anything new about yourself by doing this activity?

Yes \_\_\_\_\_ No \_\_\_\_\_

**10**  
**tips**  
*Nutrition*  
*Education Series*

## healthy eating for an active lifestyle



### 10 tips for combining good nutrition and physical activity

**For youth and adults engaging in physical activity and sports, healthy eating is essential for optimizing performance.** Combining good nutrition with physical activity can lead to a healthier lifestyle.

- 1** **Maximize with nutrient-packed foods**  
Give your body the nutrients it needs by eating a variety of nutrient-packed food, including whole grains, lean protein, fruits and vegetables, and low-fat or fat-free dairy. Eat less food high in solid fats, added sugars, and sodium (salt).
- 2** **Energize with grains**  
Your body's quickest energy source comes from foods such as bread, pasta, oatmeal, cereals, and tortillas. Be sure to make at least half of your grain food choices whole-grain foods like whole wheat bread or pasta and brown rice.
- 3** **Power up with protein**  
Protein is essential for building and repairing muscle. Choose lean and low-fat cuts of beef or pork, and skinless chicken or turkey. Get your protein from seafood twice a week. Quality protein sources come from plant-based foods, too.
- 4** **Mix it up with plant protein foods**  
Variety is great! Choose beans and peas (kidney, pinto, black, or white beans; split peas; chickpeas; hummus), soy products (tofu, tempeh, veggie burgers), and unsalted nuts and seeds.
- 5** **Vary your fruits and vegetables**  
Get the nutrients your body needs by eating a variety of colors, in various ways. Try blue, red, or black berries, red and yellow peppers; and dark greens like spinach and kale. Choose fresh, frozen, low-sodium canned, dried, or 100 percent juice options.
- 6** **Don't forget dairy**  
Foods like fat-free and low-fat milk, cheese, yogurt, and fortified soy beverages (soymilk) help to build and maintain strong bones needed for everyday activities.
- 7** **Balance your meals**  
Use MyPlate as a reminder to include all food groups each day. Learn more at [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov)
- 8** **Drink Water**  
Stay hydrated by drinking water instead of sugary drinks. Keep a reusable water bottle with you to always have water on hand.
- 9** **Know how much to eat**  
Get personalized nutrition information based on your age, gender, height, weight, current physical activity level, and other factors.
- 10** **Reach your goals**  
Earn Presidential recognition for reaching your healthy eating and physical activity goals. Log on to [www.PYFP.org](http://www.PYFP.org) to sign up for the Presidential Active Lifestyle Award (PALA+).



Go to [www.ChooseMyPlate.gov](http://www.ChooseMyPlate.gov) for more information.

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Center for Nutrition Policy and Promotion

USDA is an equal opportunity provider and employer







A Taste of Food and Fitness

**Lesson 7:**  
**Nutrition Issues in the Media**





## Evaluating Nutrition Messages

1. Is a quick fix promised? Be wary of any information that promises a quick fix to a problem. Chances are it does not have sound science behind it.
2. Are dire warnings given about a food? Rarely does a single food or product cure or cause an illness. Groups with official sounding names may have a political or economic agenda. Check out the credibility of groups or individuals making dire warnings.
3. Does it sound too good to be true? If so, the claims probably are. Many factors determine good health. Family history, long-term food and activity habits, and other factors are still unknown.
4. Does the report give simple findings from a complex study? Most people would be amazed to see the difference between the research and the media reports. Media outlets want short sound bites of information. Researchers usually write with a tone of caution. They limit their findings or call for more research. Headline writers frequently do not see the scientific reports. Their job is to get headlines noticed. Read further.
5. Is a single study used for new advice? Good science requires more than one study to find the same results. After several studies support a finding, new recommendations may be issued. Be cautious of a single study that appears to turn nutrition science on its ear.
6. Is a list of good and bad foods issued? Be skeptical of lists of foods to eat and foods to avoid totally, especially when there seems to be neither rhyme nor reason to the lists. An example might be advice to eat green peppers but avoid red peppers. Be very cautious of advice to exclude entire food groups, such as grains or meat. Excluding entire food groups can lead to nutrient deficiencies.
7. Do scientists and health organizations agree? How well was the study conducted? Scientists will read and evaluate another scientist's work before it is released to the public. This process is called peer review. Be very cautious of findings published by individuals or groups without peer reviews.  
  
When questionable information is publicized, leading health organizations will issue a response. They may state concerns with a study's findings or recommendations.
8. Is a product being sold? If a new product is promoted as a cure-all to a problem, be cautious. The people behind the information have profit motivation. Be skeptical about new diet books for the same reason. Look at the credentials of the person associated with the product or the book. Is the person a medical doctor or a doctor of literature? Anyone can call himself or herself a nutritionist. A Registered Dietitian has completed a college degree in nutrition science, has passed a national exam, and has a professional code of ethics.
9. Does the study take results from one group and apply it to others? A study of one group of individuals cannot be applied to another group in the population. The differences between children and adults, women and men, and between subgroups in the population require separate studies. Very big differences exist between animals and people. New areas of research are often studied in animals first. Animal research may show a promising new approach for further study. The results of animal research cannot be directly applied to people.

Adapted from New Zealanders Nutrition Foundation, Food and Nutrition in the News: Evaluating Nutrition Messages, December 2013. Retrieved from <https://www.nutritionfoundation.org.nz/news-and-hot-topics/media/Food-and-Nutrition-in-the-News--Evaluating-Nutrition-Messages>

## Cafeteria Connection: News Know-How

Nutrition trends and fads are everywhere. The school cafeteria can be an origin of practical, science-based information on food and nutrition.

The following are a few ways to counter misinformation in a helpful manner:

- Post bulletin boards with colorful pictures of healthful foods and nutrition information.
- Create table tents with short nutrition quizzes and answers. Address issues in a general way.
- Print nutrition news on the menus that go home with students.
- Promote a food or food group of the week or month. Provide short, informative food facts for school announcements and newsletters.
- Provide current nutrition information to student newspapers, school websites, and other school-based outlets of information.

If adults embrace a food trend or fad, they may have questions about the foods served in the school meal programs. School nutrition professionals can provide a positive perspective. A few key points to keep in mind include

- **Job One.** School nutrition programs exist to serve the students.
- **State the Standards.** List the nutrition standards school meal programs must meet to comply with USDA guidelines. Teachers use education standards in the classroom. Use terms familiar to teachers to help them understand the requirements of school meal programs.
- **Help a Health Concern.** If an adult has a specific concern, provide ideas to help the person select from the school cafeteria offerings to meet personal needs.
- **Refer to a Resource.** Keep the name and number of a nutrition expert handy. Refer questions to a district nutrition supervisor, State agency professional, local Registered Dietitian, or health department nutritionist.

Use the resources from this course for basic nutrition information. Contact the following groups for up-to-date child nutrition program responses to current issues.

Institute of Child Nutrition  
The University of Mississippi  
97 Jeanette Phillips Dr.  
University, MS 38677  
[www.theicn.org](http://www.theicn.org)

School Nutrition Association  
120 Waterfront St., Suite 300  
National Harbor, MD 20745  
[www.schoolnutrition.org](http://www.schoolnutrition.org)

Your Local Child Nutrition  
Program State Agency

USDA Food and Nutrition  
School Meals and Team  
Nutrition  
3101 Park Center Dr.  
Alexandria, VA 22302  
[www.fns.usda.gov](http://www.fns.usda.gov)



## Resource: Nutrition on the Web

The Internet is a great resource of information. Remember, anyone can post any information on the Web. Not every piece of information about nutrition on the Web is supported by science. Be careful about the web sources you trust for food and nutrition information. A flashy site with persuasive claims may not stand up to the test of science.

Here are some trustworthy sources for food, nutrition, and health information. If you are not sure about the information you find at a website, investigate more. Visit these sites and see how the information compares. Check out new information with another source. Decide if the latest nutrition news is trustworthy or too good to be true.

### Organizations

Academy of Nutrition and Dietetics  
120 South Riverside Plz., Suite 2000  
Chicago, IL 60606  
[www.eatright.org](http://www.eatright.org)

International Food Information Council Foundation  
1100 Connecticut Ave. NW, Suite 430  
Washington, DC 20036  
[www.foodinsight.org](http://www.foodinsight.org)

National Council Against Health Fraud  
119 Foster St.  
Peabody, MA 01960  
[www.ncahf.org](http://www.ncahf.org)

School Nutrition Association  
120 Waterfront St.  
National Harbor, MD 20745  
[www.schoolnutrition.org](http://www.schoolnutrition.org)

Institute of Child Nutrition  
97 Jeanette Phillips Dr.,  
University, MS 38677  
Help Desk 800-321-3054  
[www.theicn.org](http://www.theicn.org)  
Online courses, resources, videos, and research for the child nutrition professional free of charge

### Government Agencies

Food and Drug Administration  
Office of Consumer Affairs and Information  
5600 Fishers Ln, Room 16-85  
Rockville, MD 20857  
[www.fda.gov](http://www.fda.gov)  
FDA Consumer [www.fda.gov/forconsumers/consumerupdates/default.htm](http://www.fda.gov/forconsumers/consumerupdates/default.htm)

Food and Nutrition Information Center  
National Agricultural Library,  
Room 304  
U.S. Department of Agriculture  
10301 Baltimore Ave.  
Beltsville, MD 20705 <https://www.nal.usda.gov/>

USDA Consumer Information Center  
Pueblo, CO 81009  
<https://publications.usa.gov>

USDA Food and Nutrition Service  
3101 Park Center Dr.  
Alexandria, VA 22302 [www.fns.usda.gov](http://www.fns.usda.gov)  
Check the links to Team Nutrition, Eat Smart. Play Hard, Healthy School Meals Resource, and Consumer Information.





A Taste of Food and Fitness

## Appendix





## Calculating Fat Content and Percentage Answer Key

**Instructions:** Using the Nutrition Facts label on the next page, calculate the fat calories and percentage of fat content for this food product. The formulas are given. Note: 1 gram of fat contains 9 calories.

### 1. Calculate fat calories and percentage of fat content

Multiply the grams of fat by 9 = the number of fat calories.

Divide the number of fat calories by the total number of calories in the food item = % of fat content.

$$9 \times \underline{16} = \underline{144} \text{ number of fat from calories}$$

$$\underline{144} \div \underline{240} = \underline{0.6} \% \text{ of fat content}$$

### 2. Calculate saturated fat calories and percentage of saturated fat content

Multiply the grams of saturated fat by 9 = the number of saturated fat calories in the food item.

Divide the number of saturated fat calories in the food item by the total number of calories in the food item = % of saturated fat.

$$\underline{2} \times 9 = \underline{18} \text{ number of saturated fat from calories}$$

$$\underline{18} \div \underline{240} = \underline{.075 \text{ or } .08} \% \text{ of saturated fat}$$



## Identifying Whole Grains Answer Key

**Instructions:** Identify which of these grains are whole grains. Place a mark in the “Yes, It is a Whole Grain” column if it is or in the “No, It is not a Whole Grain” column if it is not.

Grains	Yes, It is a Whole Grain or No, It is not a Whole Grain
Amaranth	<b>Yes</b> , amaranth is a whole grain.
Bulgur (cracked wheat)	<b>Yes</b> , bulgur (cracked wheat) is a whole grain.
Buckwheat groats	<b>Yes</b> , buckwheat groats are whole grain. They are usually cooked in a manner similar to cooking rice.
Brown rice	<b>Yes</b> , brown rice is whole grain. In some areas of the country, brown rice should be refrigerated to retard spoilage.
Couscous	<b>No</b> , couscous is not whole grain unless it is “whole wheat couscous.”
Degerminated cornmeal	<b>No</b> , only whole cornmeal or whole grain cornmeal is whole grain. “Degerminated” means that the germ has been removed. Removing the germ from whole cornmeal results in a longer shelf life.
Graham flour	<b>Yes</b> , graham flour is whole grain. Graham flour is whole wheat flour that is slightly coarser than the regular whole wheat flour.
Grits	<b>No</b> , grits are not whole grain unless they are made from whole grain corn. Specialty mills may produce whole-grain grits.
Instant oatmeal	<b>Yes</b> , whole oats (old fashioned, quick, and instant) are whole grain. However, instant oatmeal is not encouraged because it is highly processed.
Long-grain white rice	<b>No</b> , white rice is not whole grain. White rice is produced by refining whole grain rice to remove the germ and bran.
Millet flakes	<b>Yes</b> , millet flakes is a whole grain.
Pearled (also called pearl) barley	<b>No</b> , pearled barley is not whole grain. “Pearled” indicates that the bran has been removed.
Quinoa	<b>Yes</b> , quinoa is a whole grain. It contains every amino acid and is rich in lysine. Quinoa is a good source of iron, magnesium, vitamin E, potassium, and fiber.
Rolled oats	<b>Yes</b> , rolled oats are whole grain. Rolled oats are made by hulling and cleaning whole oats, then steaming and flattening them. Rolled oats are also called old fashioned oats.

Semolina	<b>No</b> , semolina is not whole grain. Semolina is durum wheat that is ground more coarsely than regular wheat flours.
Wheat flour	<b>No</b> , wheat flour is not whole grain. It is produced by refining whole wheat to remove the germ and bran.
Rye berries	<b>Yes</b> , rye berries are whole grain. Various grains with “berries” listed after the grain (wheat, oat, rye, etc.) are whole grains.
Whole-grain barley	<b>Yes</b> , whole grain barley is whole grain.
Whole wheat flour	<b>Yes</b> , whole wheat flour is a whole grain.
White whole wheat flour	<b>Yes</b> , white whole wheat flour is whole grain. The current wheat market in the U.S. includes red wheat and a small amount of white wheat. The brown color commonly associated with whole wheat products results from the darker bran color of red wheat. White whole wheat products are lighter in color and lack the slightly bitter taste associated with the bran in red wheat. Read the ingredient statement carefully on products labeled as “white wheat,” as some of these products may not contain any white whole wheat flour.

Source: Nutrition 101: A Taste of Food and Fitness, 3rd Edition

## Vegetable Subgroup Relay Answer Key

**Instructions:** Look at the vegetable in the first column and decide which subgroup that vegetable belongs and place an X in that column.

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Acorn Squash		X			
Artichokes					X
Asparagus					X
Avocado					X
Bamboo Shoots					X
Beans, Green or Wax					X
Bean Sprouts					X
Beet Greens	X				
Beets					X
Bell or Chili Peppers					X
Black Beans			X		
Black-eyed Peas, Mature, Dry			X		
Bok Choy (Cabbage Chinese or Celery)	X				
Breadfruit				X	
Broccoli	X				
Brussels Sprouts					X
Butternut Squash		X			
Cactus					X
Carrot		X			
Cassava				X	
Cauliflower					X
Celery					X
Chayote (Mirliton)					X
Cherry Peppers		X			
Chicory	X				
Chinese Snow Peas					X
Collard Greens	X				
Corn				X	
Cucumbers					X

## Vegetable Subgroup Relay Answer Key

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Dark Green Leafy Lettuce	X				
Edamame			X		
Eggplant					X
Escarole Endive	X				
Fresh cowpeas, field peas, or black-eyed peas (not dry)				X	
Garbanzo Beans (chickpeas)			X		
Grape Leaves	X				
Great Northern Beans			X		
Green Cabbage					X
Green Onions					X
Green Peas, Dry			X		
Hubbard Squash		X			
Iceberg (Head) Lettuce					X
Jicama (Yam Bean)				X	
Kale	X				
Kidney Beans			X		
Kohlrabu					X
Lentils			X		
Lima Beans, Canned, Fresh or Frozen				X	
Lima Beans, Dry			X		
Mung Beans			X		
Mushrooms					X
Mustard Greens	X				
Navy Beans			X		
Okra					X
Onions					X
Parsley	X				
Parsnips				X	



## Vegetable Subgroup Relay Answer Key

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Pepperoncini					X
Pigeon Peas				X	
Pimentos		X			
Pink Beans			X		
Pinto Beans			X		
Plantains				X	
Poi				X	
Potato Products, White				X	
Pumpkin		X			
Radishes					X
Red Cabbage					X
Red/Orange Peppers		X			
Romaine Lettuce	X				
Rutabagas					X
Salsa		X			
Sauerkraut					X
Seaweed					X
Small Red Beans			X		
Soybeans, Dry, Mature			X		
Spinach	X				
Split Peas			X		
Sweet Potatoes		X			
Swiss Chard	X				
Taro (Malanga)				X	
Tomatillos					X
Tomatoes		X			
Tomato Products		X			
Turnips					X
Turnip Greens	X				



## Vegetable Subgroup Relay Answer Key

Vegetables	Dark Green	Red/ Orange	Beans/Peas (Legumes)	Starchy	Other
Watercress	X				
Water Chestnuts				X	
White Beans			X		
Yautia (Tannier)				X	
Zucchini					X

Source: <https://www.choosemyplate.gov/>

## What's for Lunch? Answer Key

**Instructions:** Using the two handouts Vitamins and Minerals, compare the following two menus. Which menu provides the most vitamins and minerals? Determine the vitamins and minerals that can be found in the food items in each menu and list them in the charts.

### Menu 1

Whole Wheat Chicken Nuggets  
Sweet Potatoes  
Green Beans  
Apple  
Milk

Food Item	Vitamins and Minerals
Breading	Vit. E, Thiamin, Riboflavin, Niacin
Chicken	Vit. B12, Pantothenic Acid, Sulfate, Selenium, Sodium
Sweet Potatoes	Vit. A, Potassium, Biotin, Pantothenic Acid, Copper
Green Beans	Vit. A, C, B6, Calcium, Iron, Magnesium
Apple	Vit. A, C, B6, Calcium, Iron, Potassium, Magnesium
Milk	Vit. A, D, K, Riboflavin, Calcium, Phosphorus

### Menu 2

Chef Salad – Turkey, Ham, and Cheese  
Romaine Lettuce  
Baby Spinach  
Shredded Carrots  
Cucumbers  
Tomatoes  
Mandarin Oranges  
Whole Wheat Breadsticks  
Milk

Food Item	Vitamins and Minerals
Turkey	Pantothenic Acid, Selenium
Ham	Vit. D, B12, B6, Iron Magnesium
Cheese	Vit. D, B12, Riboflavin, Biotin, Calcium, Iron, Sulfate, Magnesium
Romaine Lettuce and Spinach	Vit. A, E, K, Thiamin, Riboflavin, Folate, Calcium, Sodium, Potassium, Iron, Copper
Carrots	Vit. A, D, B12, B6, Iron, Potassium, Calcium, Magnesium
Cucumbers	Vit. A, C, Magnesium, Iron
Tomatoes	Vit. A, B6, C, Pantothenic Acid, Potassium, Salt
Oranges	Folate, Vit. A, C, B6, Potassium, Calcium
Breadsticks	See Breading Menu 1
Milk	See Menu 1





## Resources

Academy of Nutrition and Dietetics ([www.eatright.org](http://www.eatright.org))

American Cancer Society ([www.cancer.org](http://www.cancer.org))

American Dental Association ([www.ada.org](http://www.ada.org))

American Diabetes Association ([www.diabetes.org](http://www.diabetes.org))

Apricot Producers of California ([www.apricotproducers.com](http://www.apricotproducers.com))

California Cling Peach Board ([www.calclingpeach.com](http://www.calclingpeach.com))

California Dried Plum Board ([www.californiadriedplums.org](http://www.californiadriedplums.org))

California Kiwifruit Commission ([www.kiwifruit.org](http://www.kiwifruit.org))

California Raisin Marketing Board ([www.raisins.org](http://www.raisins.org))

California Table Grape Commission ([www.tablegrape.com](http://www.tablegrape.com))

California Tomato Grower's Association, Inc. ([www.ctga.org/](http://www.ctga.org/))

Cherry Marketing Institute ([www.choosecherries.com](http://www.choosecherries.com))

Florida Department of Citrus ([www.floridacitrus.org/oj/](http://www.floridacitrus.org/oj/))

Florida Tomato Committee ([www.floridatomatoes.org](http://www.floridatomatoes.org))

Food and Drug Administration Office of Consumer Affairs and Information ([www.fda.gov](http://www.fda.gov))

FDA Consumer online ([www.fda.gov/forconsumers/consumerupdates/default.htm](http://www.fda.gov/forconsumers/consumerupdates/default.htm))

Food and Nutrition Information ([http://fnic.nal.usda.gov/nal\\_display/index.php?info\\_center=4&tax\\_level=](http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=))

International Banana Association ([www.thepacker.com/](http://www.thepacker.com/))

International Food Information Council Foundation ([www.foodinsight.org](http://www.foodinsight.org))

March of Dimes ([www.marchofdimes.org](http://www.marchofdimes.org))

Mushroom Council ([www.mushroominfo.com/](http://www.mushroominfo.com/))

National Council Against Health Fraud ([www.ncahf.org](http://www.ncahf.org))

National Onion Association ([www.onions-usa.org](http://www.onions-usa.org))

National Osteoporosis Foundation ([www.nof.org](http://www.nof.org))

National Potato Promotion Board ([www.healthypotato.com](http://www.healthypotato.com))

National Watermelon Promotion Board ([www.watermelon.org](http://www.watermelon.org))

New England Apple Association ([www.newenglandapples.org](http://www.newenglandapples.org))

Northwest Cherry Growers ([www.nwcherries.com](http://www.nwcherries.com))

Oregon Raspberry and Blackberry Commission ([www.oregon-berries.com](http://www.oregon-berries.com))

Produce for Better Health Foundation ([www.pbhfoundation.org/](http://www.pbhfoundation.org/))

Produce Marketing Association ([www.pma.com](http://www.pma.com))

School Meals and Team Nutrition ([www.fns.usda.gov](http://www.fns.usda.gov))

School Nutrition Association ([www.schoolnutrition.org](http://www.schoolnutrition.org))

U.S. Apple Association ([www.usapple.org](http://www.usapple.org))

U.S. Department of Agriculture Consumer Information Center Pueblo ([www.pueblo.gsa.gov](http://www.pueblo.gsa.gov))

U.S. Department of Agriculture Food and Nutrition Service ([www.fns.usda.gov/nutritionlink/](http://www.fns.usda.gov/nutritionlink/))

U.S. Department of Agriculture Food and Nutrition Service ([www.fns.usda.gov/2017-edition-accommodating-children-disabilities-school-meal-programs](http://www.fns.usda.gov/2017-edition-accommodating-children-disabilities-school-meal-programs))

U.S. Highbush Blueberry Council ([www.blueberry.org](http://www.blueberry.org))

United Fresh Produce Association ([www.unitedfresh.org](http://www.unitedfresh.org))

Washington State Apple Commission ([www.bestapples.com](http://www.bestapples.com))

Wheat Foods Council ([www.wheatfoods.org/](http://www.wheatfoods.org/))



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