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# Altering Recipes for Good Health

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# Artful Recipe Altering

For several years, health professionals have advised Americans to eat less fat, sugar, and salt, and to eat more fiber. The USDA's MyPyramid.gov website, based on the *Dietary Guidelines for Americans* (2005), reflects these recommendations.

To make an eating plan or healthy diet that follows the *Dietary Guidelines for Americans*, take the following actions:

- emphasize fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products;
- include lean meats, poultry, fish, beans, eggs, and nuts; and
- keep it low in saturated fats, trans fats, cholesterol, salt (sodium), and added sugars.

Visit MyPyramid.gov to help you in selecting your eating plan based on your current eating patterns, health status, daily exercise plan, and potential risk for health problems linked to diet, such as obesity, diabetes, or heart disease. Perhaps a change to some cooking methods may be in order.

## Recipes = Chemical Formulas

Recipes specify the ingredients, proportions, and methods necessary to produce a quality product. Companies and publishers spend time and money testing recipes for consumer use. Any change made in the recipe will produce a slightly different product from the one that was tested and published. Some changes you may like and others you may not.

Recipes for combined foods, such as casseroles and soups, are more flexible than others. A cookie recipe is more adaptable than a cake recipe. Recipes for most baked products can be altered, but recipes for any preserved product, such as pickles, salsa, jellies, or candies should not be changed at all.

Modifying a recipe may produce a product that doesn't meet your expectations. For example, a cake made with less fat will not have the same flavor or texture as the high-fat version. Cookies with less sugar or fat will still be acceptable but might not look or taste the same as those made by the original recipe. Substituting skim milk for whole milk in puddings, soups, and sauces will give a product that is less rich and creamy but has less fat and calories.

## Ingredients that can Be Changed

Most people either fail to notice much difference or accept the difference that results when the following kinds of changes are made.

**Reduce sugar by one-third.** For example, if a recipe says to use 1 cup of sugar, use ⅔ cup. This change works best in canned and frozen fruits and in making puddings and custards. In cookies and cakes, try using ½ cup sugar per cup of flour. For quick breads and muffins, use 1 tablespoon sugar per cup of flour. To enhance the flavor when sugar is reduced, add vanilla, cinnamon, or nutmeg.

**Reduce fat by one-third.** For example, if a recipe calls for ½ cup of fat, use ⅓ cup. This method works best in gravies, sauces, puddings, and some cookies. For cakes and quick breads, use 2 tablespoons fat per cup of flour.

**Omit salt or reduce by one-half.** For example, if a recipe calls for ½ teaspoon salt, use ¼ teaspoon. This method may be more acceptable if you gradually reduce the amount of salt each time you make the recipe. Herbs, spices, or salt-free seasoning mixes can also be used as flavor enhancers. Do not eliminate salt from yeast bread or rolls; it is essential for flavor and helps the texture.

**Substitute whole grain and bran flours.** *Whole wheat flour* can replace from one-fourth to one-half of the all-purpose flour. For example, if a recipe has 3 cups all-purpose flour, use 1½ cups whole wheat flour and 1½ cups all-purpose flour.

*Oat bran or oatmeal* (that has been ground to flour consistency in a food processor or blender) can replace up to one-fourth of the all-purpose flour. For example, if a recipe has 3 cups all-purpose flour, use ¾ cup oat bran or ground oatmeal and 2¼ cups all-purpose flour.

*Bran cereal flour* is made by grinding a ready-to-eat cereal such as Bran Buds® or 100% Bran® in a blender or food processor for 60 to 90 seconds. It can replace up to one-fourth of the all-purpose flour. For example, if a recipe calls for 2 cups all-purpose flour, use ½ cup bran flour and 1½ cups all-purpose flour.

# Detect Fat

All fats and oils are high in calories, but you can make a healthier choice by selecting those with less saturated fat. Some sources of saturated fat include animal products and tropical oils such as palm kernel or coconut oil. Another fat of concern is trans fatty acids (partially hydrogenated vegetable oil). Trans fatty acids are found in stick margarine, vegetable shortening, and some prepared foods such as cakes, cookies, crackers, and commercially fried foods. Trans fatty acids (trans fats) occur naturally in small quantities in meats (beef, pork, lamb), butter, and milk. Since 2006, trans fats have to be identified on the food label. Likewise, when you use lower-fat milk products, you reduce fat, calories, and cholesterol.

## Fat and Oil Comparison

| Type of fat or oil | Cholesterol (mg/Tbsp.) | Saturated fat or oil |
|---|---|---|
| Coconut oil | 0 | 77% |
| Butter | 33 | 54% |
| Palm oil | 0 | 51% |
| Beef fat | 14 | 51% |
| Animal fat shortening | 0 | 44% |
| Lard | 12 | 41% |
| Cottonseed oil | 0 | 27% |
| Vegetable shortening (Crisco) | 0 | 26% |
| Margarine | 0 | 18% |
| Soybean oil | 0 | 15% |
| Olive oil | 0 | 14% |
| Peanut oil | 0 | 13% |
| Corn oil | 0 | 13% |
| Sunflower oil | 0 | 11% |
| Safflower oil | 0 | 9% |
| Canola oil | 0 | 6% |

From *Small Steps Make a Big Fat Difference,* Puritan Oil, Proctor and Gamble, 2000.

Fats are not always interchangeable, as shown in the examples below:

- Oil is 100 percent fat; margarine is an emulsion containing 80 percent fat and 20 percent water ("lite" margarine-type spreads contain a higher proportion of water). Substituting 1 cup oil for 1 cup margarine adds more fat than the recipe intended. Consequently, cookies will feel and taste greasy.
- A well-textured cookie depends on thorough creaming of the fat and sugar. Oil cannot be creamed, so substituting it for a solid shortening is likely to change both texture and volume.
- Can lite margarine-type spreads be substituted for solid shortening when baking? It is possible, but it cannot be a direct substitution. Since lite or diet margarines have more water, the amount of liquid in the recipe also must be reduced. Rather than substituting

reduced-fat margarines, try using less of the regular margarine. You won't have to alter the amount of liquid, and you will save calories.

## Milk Product Comparison

(Values are approximations for general comparisons; check the labels for specific values.)

| Milk products (1 cup) | Calories | Fat (g) | Cholesterol (mg) |
|---|---|---|---|
| Whipping cream (Heavy cream, fluid) | 832 | 90 | 336 |
| Medium cream (25% fat) | 590 | 61 | 208 |
| Light cream | 470 | 46 | 159 |
| Half and half (half milk, half cream) | 315 | 28 | 89 |
| Whole milk | 150 | 8 | 33 |
| 2 percent milk | 120 | 5 | 18 |
| 1 percent milk | 100 | 3 | 10 |
| Skim milk | 85 | trace | 4 |
| Evaporated whole milk | 340 | 19 | 74 |
| Evaporated skim milk | 200 | 1 | 9 |

From *Food Values of Portions Commonly Used*, 18th edition. New York: Harper and Row. 2005

### Did You Know?

You can use reduced-fat sour cream, low-fat or non-fat yogurt, or cottage cheese instead of regular sour cream in sauces and dips. Skim milk can be used instead of whole milk in most recipes. Evaporated milk can be substituted for whipping cream, and evaporated skim milk can be substituted for regular evaporated milk in some recipes.

## Ingredient Substitutions that Are Heart-Smart

By making a few substitutions and changes, you can still prepare your favorite recipes and reduce your intake of calories, fat, and cholesterol.

| INSTEAD OF | TRY | BEST CHOICE |
|---|---|---|
| Butter | 60/40 margarine - butter blend | Margarine or reduced calorie margarine |
| Sour cream | Lite sour cream | Mock Sour Cream |
| 2 whole eggs | 1 whole egg plus 2 egg whites | 4 egg whites, commercial egg substitute, or Homemade Egg Substitute |
| Whole milk | 2% milk | Skim milk |
| Cream | Evaporated milk | Evaporated skim milk |
| Cream cheese | Light cream cheese or Neufchâtel | Yogurt Cheese |

| INSTEAD OF | TRY | BEST CHOICE |
|---|---|---|
| Whipped cream or non-dairy whipped topping | Non-fat whipped topping | Non-fat whipped topping or no-fat whipped topping |
| Cheddar, Colby, Swiss Cheese | Cut down on the amount you usually eat | Select part-skim mozzarella, reduced-fat natural cheese, farmer cheese, or low-fat processed cheese |
| Cottage cheese | Low-fat cottage cheese | Nonfat ricotta or cottage cheese |
| Baking chocolate (1 ounce) | 3 tablespoons powdered cocoa plus 1 tablespoon cooking oil | 3 tablespoons powdered cocoa plus 1 tablespoon cooking oil |
| Mayonnaise | Lite mayonnaise | Half cholesterol-free mayonnaise and half non-fat yogurt |
| Salad dressing | Reduced-fat dressing | Fat-free dressing |
| Chicken with skin | Remove skin *after* cooking | Remove skin *before* cooking |
| Regular ground beef | Lean ground beef | Use extra lean ground beef or lean ground turkey |

## Recipes for Reduced Fat Substitutes

To save money as well as calories, make your own low-fat substitutes by using the recipes that follow.

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**No-Fat Whipped Topping**

1 tablespoon unflavored gelatin
2 tablespoons boiling water
½ cup non-fat dry milk powder
⅓ cup ice water
2 tablespoons lemon juice
3 tablespoons sugar
1 teaspoon vanilla

1. Dissolve gelatin in boiling water.
2. In a thoroughly chilled small bowl, beat milk and ice water.
3. Beat in lemon juice.
4. Add sugar and vanilla, and beat to soft peaks.
5. Add gelatin mixture and beat.

**Yield:** about 1½ cups

**Calories:** 12 per tablespoon

**Mock Sour Cream**

1 cup lowfat cottage cheese*
2 tablespoons skim milk
1 tablespoon lemon juice

Combine all ingredients using a blender or food processor.

**Yield:** about 1 cup

| | Sour Cream | Mock Sour Cream |
|---|---|---|
| | *Per Tablespoon* | |
| **Calories** | 26.0 | 14 |
| **Fat, grams** | 2.5 | 0 |
| **Cholesterol, mg** | 5.0 | 1 |

*Use non-fat cottage cheese, if available.

Another option is to use a blender to combine equal amounts of low-fat or non-fat cottage cheese with low fat or non-fat plain yogurt.

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**Casserole Sauce Mix**

Use this recipe instead of canned cream soups in casserole recipes. It has about one-third the calories.

2 cups non-fat dry milk powder
¾ cup cornstarch
¼ cup instant reduced sodium chicken or beef bouillon
½ teaspoon dried crushed thyme
½ teaspoon dried crushed basil
¼ teaspoon pepper

1. Combine all ingredients using a blender or food processor. Store in an airtight container.
2. To prepare a substitute for one can of condensed cream soup in recipes, stir together a cup dry mix and 1¼ cups water in a saucepan.
3. Cook and stir until thickened.

**Yield:** Equivalent to 9 cans condensed soup

**Calories:** 107 per cup of dry mix **Fat:** 1 gram

**Homemade Egg Substitute (for Cooked Products Only):**
Because this recipe contains raw eggs, do not use it in uncooked products such as eggnog and ice cream.

¼ cup non-fat dry milk powder
1 teaspoon vegetable oil
6 egg whites

1. Combine all ingredients (using a blender or electric mixer) until the mixture is smooth.
2. Store in covered container in the refrigerator for up to 2 days, or freeze in ¼ cup portions; thaw overnight in the refrigerator.

**Yield:** 1 cup; ¼ cup is equivalent to 1 egg.

| | **Large Egg** | **Homemade Egg Substitute** |
|---|---|---|
| **Calories** | 79.0 | 70.0 |
| **Fat, grams** | 5.6 | 3.5 |
| **Cholesterol, mg** | 213.0 | <1.0 |

**Yogurt Cheese**
Use this recipe as a substitute for cream cheese in spreads or in desserts and frostings. Make your own spreads by mixing with cinnamon, orange peel, dried fruit, jam, or herbs.

32 ounces plain non-fat or low-fat yogurt made without stabilizers or gelatin

1. Line a strainer with a double layer of cheesecloth or with a paper coffee filter; place it over a bowl.
2. Pour yogurt into the lined strainer. Cover it with plastic wrap and refrigerate.
3. Allow it to drain for 8–24 hours, until the liquid has drained into the bowl and the yogurt is thick and spreadable. The longer it drains, the more whey is expressed and the firmer the cheese.
4. Remove the cheese from the cloth and refrigerate in an airtight container.

| | **Cream cheese** | **Yogurt cheese** |
|---|---|---|
| | | *Per tablespoon* |
| **Calories** | 49.0 | 5 |
| **Fat, grams** | 4.9 | 0 |
| **Cholesterol, mg** | 15.5 | 0 |

## Did You Know?

The amount of saturated fat in the diet has a much greater effect on blood cholesterol than does the amount of cholesterol in the diet.

## Remove the Fat

Healthy eating involves recognizing habits that may not be so healthy and then taking steps to change them. For example, think about the foods you ate yesterday. Which ones contained fat? Write them down in the left column below. What lower-fat foods could you have chosen instead? Write them down in the right column.

| Foods eaten | | Lower fat choices |
|---|---|---|
| | **Breakfast** | |
| | | |
| | | |
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| | | |
| | | |
| | **Snack** | |
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| | **Lunch** | |
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| | **Snack** | |
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| | **Dinner** | |
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| | | |
| | **Snack** | |
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## Fat Substitute Facts

Some consumers are interested in lowering their fat intake with the use of fat substitutes. Fat substitutes help reduce the intake of high-fat foods with reduced fat substitutes of familiar foods. These fat substitutes do contain about the same number of calories as carbohydrates and protein, so they should be eaten within the context of a healthful diet using moderation and variety.

### Fat Substitutes in Processed Foods

Modified foods may be labeled as light (lite), reduced calorie, or reduced fat. These foods may be made from a fat-reduced formula or contain a commercial fat substitute with fewer calories per gram than fat. Two major types of fat substitutes are carbohydrate-based and protein-based.

- **Carbohydrate-based fat substitutes** such as modified starches, dextrins, cellulose, and gums work by combining with water to provide a thicker texture and appearance, as in fat-free salad dressings.
- **Protein-based fat substitutes** made of skim milk protein provide the sensation of creaminess as well as improving appearance and texture. Low-fat cheese made with a protein-based substitute has an appearance and texture close to full-fat cheese.

Both types of fat substitutes contribute some calories, although less than that contributed by fat. Often, a combination of ingredients is used to create higher quality reduced-fat products.

### What Types of Foods Use Fat Substitutes?

Foods commonly high in fat such as margarines, salad dressings, mayonnaise, cheese, sour cream, and frozen desserts have used fat substitutes with varying degrees of success. Now you can buy low-fat ice creams with either a protein-based fat substitute or a combination of starches and gums. Many baked goods and some candies are also made using fat substitutes to help reduce their fat.

**Cutting Fat in Foods**

| | **Traditional Recipe** *(grams of fat)* | **Made Using Fat Substitute** *(grams of fat)* |
|---|---|---|
| Margarine, 1 tablespoon | 7-12 | 0-6 |
| Salad dressing | | |
| Creamy, 2 tablespoons | 11-21 | 0-8 |
| Clear, 2 tablespoons | 5-20 | 0-6 |
| Mayonnaise, 1 tablespoon | 11 | 0-5 |
| Cheese | | |
| Hard, 1 ounce | 8-11 | 4-5 |
| Processed, 1 ounce | 7-9 | 0-4 |
| Cream cheese, 2 tablespoons | 9-10 | 0-5 |
| Sour cream, 1 tablespoon | 2-5 | 0-1 |
| Ice cream, ½ cup | 7-26 | 0.3-2 |

*Source: Pennington, J.A.T. Bowes & Church's Food Values of Portions Commonly Used, 18th edition. Philadelphia: J.B. Lippincott Company, 2003; and Facts about Fat Substitutes Nutrition Fact Sheet, National Center for Nutrition and Diabetes, 2004.*

**What Are Some Fat Substitutes on the Market Today that Are Approved by the Food And Drug Administration?**

- Simplesse® = protein-based fat substitute
- Olestra® = synthetic triglyceride modifications with sugar molecules containing long chain fatty acids

**Recipes for Using Fat Substitutes**
To find recipes for baking or for other food preparation using fat substitutes, contact consumer information at the following numbers:

- Simplesse® Fat, CP Kelco Company: 1-678-247-7300 or http://www.cpkelco.com/products/index.html
- Olean® (Olestra®), Proctor and Gamble Consumer Hotline: 1-800-477-8899 or e-mail at chemicalsinfo.im@pg.com
- For all others, contact the company directly for consumer information about the products' use in food preparation.

**Three contacts about the safety of using fat substitutes:**

- American Dietetic Association's Hotline: 1-800-366-1655; ADA: 800-877-1600; www.eatright.org
- American Heart Association 1-800-AHA-USA; 1-800-(242-8721) http://www.americanheart.org
- Food and Drug Administration, Consumer Inquiries**:** 1-888-INFO-FDA (463-6332), http://www.fda.gov

# Detect Sugar

At least 21 different forms of simple carbohydrates are identified as sugars. All provide calories, but there are few nutrients. Sugar is a necessary ingredient in many products because it provides sweetness and bulk.

## What Health Concerns Are Related to Sugar?

Health concerns about sugar consumption are not as strong as they were 20 years ago. The only health problem strongly linked to sugar is tooth decay. Studies have found that most people consume small to moderate amounts of sugar within the context of healthful meals.

Sugar is not "bad" in terms of being harmful. But its use should be monitored because it contains more calories than nutrients. Eating too many sugary foods can cause individuals to bypass more nutritious foods or to take in more calories than needed and thus lead to weight gain. Weight gain and/or obesity lead to degenerative diseases such as cardiovascular disease, diabetes, hypertension, and it may aggravate other diseases such as arthritis.

## What about Sugar Substitutes?

Sugar substitutes make the food sweeter with few calories and no nutrients. They don't have the functional properties of sugar, and some are adversely affected by heat. The five alternate sweeteners, approved by the U.S. Food and Drug Administration, on the market today are: saccharin, aspartame, acesulfame-K, sucralose, and neotame. Neotame is available only in processed foods and not for table use to date (2007).

Fruit juices, honey, and molasses are offered as sugar substitutes for baking and cooking. However, the sugar they provide is no more nutritious than other forms of sugar. The amounts used are seldom enough to provide meaningful vitamins or minerals.

## To Reduce Sugar

- To cut down on sugar, try new recipes or adjust old ones by using one-third less. To add flavor, use more vanilla or spice.
- Satisfy your longing for something sweet with fruits for snacks and desserts. Eat baked sweets and candies less frequently and/or in smaller portions.
- Read labels of commercially prepared products; many are high in sugar. Whenever possible, substitute home-prepared items made with less sugar.
- Recognize that the following are names of sugars: sucrose, sorbitol, maple syrup, corn syrup, high fructose corn syrup, glucose, fructose, mannitol, molasses, dextrose, maltose, honey, and lactose.
- If you are trying to lose weight and/or have diabetes, then select alternate sweeteners, such as: saccharin (Sweet'N'Low®), aspartame (Equal® or NutraSweet®), acesulfame-K (SweetOne®), or sucralose (Splenda®). Either saccharin, sucralose, or acesulfame-K can be used for cooking because they are not destroyed by heat. Aspartame is a protein-derivative and is destroyed by heat, losing its flavor.

To find recipes for baking, cooking, or preserving food and other techniques regarding the use of these products, contact the company's consumer representative:

- **Saccharin - Sweet'N'Low®** Hotline: 1-800-231-1123; 1-800-221-1763
- **Aspartame, Neotame - NutraSweet® or Equal®**: 1- 800-323-5316 (**Equal®**); or 1-800-323-5321 (**NutraSweet®)**
- **Acesulfame-K - SweetOne®**: 1-800-544-8610; or **Sunette®** 1-800-344-5807
- **Sucralose - Splenda®**: 1-800-777-5363

For all other questions about non-nutritive sweeteners, contact the following organizations:

- American Dietetic Association's Hotline 1-800-366-1655, ADA: 800-877-1600, www.eatright.org
- American Diabetes Association's Hotline 800-232-3472 or 800-432-3472 http://www.diabetes.org
- American Heart Association 1-800-AHA-USA; 1-800-(242-8721) http://www.americanheart.org
- Food and Drug Administration, Consumer Inquiries**:** 1-888-INFO-FDA (463-6332), http://www.fda.gov

## Non-Nutritive Sweetener Conversion Chart

| **Sugar** | 2 teaspoons | ¼ cup | ⅓ cup | ½ cup | 1 cup |
|---|---|---|---|---|---|
| **Non-nutritive Sweeteners** | | | | | |
| **Saccharin** | | | | | |
| Sweet N' Low ® packet | 1 | 3 | 4 | 6 | 12 |
| Sweet N' Low ® bulk | 1 | 1 tsp. | 1¼ tsp. | 2 tsp. | 4 tsp. |
| Sweet N' Low ® liquid | 20 drops | ½ tsp. | 2 tsp. | 1 Tbsp. | 2 Tbsp. |
| *for other brands, see food label for sugar equivalents | | | | | |
| **Aspartame** | | | | | |
| Equal®/NutraSweet® packet | 1 | Not in bulk packages<br>Not recommended for cooking/baking | | | |
| **Acesulfame-K** | | | | | |
| SweetOne® packet | 1 | 3 | 4 | 6 | 12 |
| *Sugar Twin®, Weight Watchers®, Sucaryl®, Adolphs®, and Sweet 10® | | | | | |
| **Sucralose** | | | | | |
| Splenda®: *(equivalent of sugar)* | 2 teaspoons | ¼ cup | ⅓ cup | ½ cup | 1 cup |

# Detect Fiber

Dietary fiber is the undigested material left after nutrients are absorbed from food. Both insoluble fibers (such as in wheat, fruits, and vegetables) and soluble fibers (such as in oats, legumes, apples, and citrus fruits) are important. Study the high fiber choices in this section and use your imagination to find ways to include them more often. Here are three general reminders.

1. Fruits, vegetables, and grains have fiber; animal products do not.
2. The closer a fruit, vegetable, or grain is to its original, natural state—the more fiber it will have. An apple has more fiber than applesauce, which has more fiber than apple juice.
3. Substitute a high-fiber food for a low-fiber one to increase your daily fiber supply.

## Fiber Substitutes

| Instead of | Try | For |
|---|---|---|
| Chinese noodles<br>canned onion rings<br>croutons/bacon bits | bran cereal | casserole toppings |
| cornflakes<br>graham crackers<br>bread crumbs | crushed bran cereal<br>wheat or oat bran | dessert crusts and crumb toppings,<br>in meatloaf, for chicken/fish coatings |
| white rice | brown rice<br>barley, wheat kernels | casseroles, soup, stir fry, side dishes |
| chocolate chips | half chips & half raisins | cookies, bars |

Add bran cereals, oat bran, and wheat bran to streusel toppings, chili, sloppy joes, sandwich spreads, and spaghetti sauce; or use as a topping for baked potatoes and salads. Bran cereal flour can be substituted for up to one-fourth of the all-purpose flour to increase fiber content. Bran cereals can contain 30 grams of fiber or more per cup. Check labels for exact amounts.

Look on the **Ingredients Listing** on a label for whole grains, cellulose, and other fiber sources such as cellulose, wheat gluten, or starch, etc. Look at the **Nutrition Facts** on a label to find the amount of both total carbohydrates and dietary fiber. As a general rule, a food is considered **a good source of fiber** if it has between 3 to less than 5 grams of fiber, or **high-fiber** if it has 5 or more grams of fiber.

### Do You Know which Food Groups Provide the Most Fiber?

Take a look at these foods and the relative amount of fiber each group provides.

| Food Groups | Grams Fiber per Serving |
|---|---|
| breads | 1 |
| whole fruits, cereals and grains | 2 |
| starchy vegetables | 3 |
| nonstarchy vegetables | 1–4 |
| beans, peas, and lentils | 6 |

## Know Your Flours

When a recipe lists flour as an ingredient, we assume it means all-purpose flour. To increase your success rate when substituting other flours, we need to review why flour is used.

The gluten that is formed when protein from wheat flour is combined with liquid gives dough its elasticity and baked products their structure. Flours from other grains have little or no gluten-forming protein. Using specialty flours may result in a reduced volume and a "heavier" finished product, as well as changes in color, flavor, and nutritional value. When using specialty flours:

- Stir whole-grain flours with a spoon before measuring but do not sift. Spoon into the measuring cup and level with a metal spatula.
- Decrease the oven temperature by 25 °F, and increase the baking time because the dough is likely to be more compact.
- For yeast breads, add all of the specialty flour first. Then work the all-purpose or bread flour into the dough. The doughs are mixed and kneaded for a shorter time because of the higher proportion of non-gluten-forming materials. The dough also requires a shorter rising time.

**Flour Substitutes**

**As a thickening:** 1 tablespoon flour = ½ tablespoon cornstarch, potato starch, rice starch, or arrowroot starch
or = 1 tablespoon quick-cooling tapioca
or = 2 teaspoons tapioca

**Self-rising flour:** Add 1½ teaspoons of baking powder and ½ teaspoon of salt per cup of all-purpose flour

**How Much Fiber Is in Flour?**

All-purpose flour is a highly refined ingredient; consequently, it has very little fiber. If you want to increase fiber in home-baked products, you can substitute other flours in many products. Here's how some flour choices compare in fiber content:

| LEAST FIBER | | MOST FIBER | | |
|---|---|---|---|---|
| **All Purpose Flour** | **Medium Rye Flour** | **Cornmeal** | **Oat Flour*** | **Whole Wheat Flour** |

** To make oat flour, put oatmeal in the blender, and blend about 60 seconds. Store in the refrigerator or freezer because of its high- fat content.*

To ensure that whole-wheat fiber—not caramel coloring nor molasses—is present, read labels on bread products. By law, a product labeled "whole wheat" must be made from 100 percent whole-wheat flour. Wheat bread may have varying proportions of enriched white flour and whole-wheat flour. The type of flour present in the largest amount is listed first on the ingredient label.

**Allergies to Wheat?**

Replacement substitutes for one cup of flour are:

| | | | |
|---|---|---|---|
| • Barley flour | ½ cup | **OR** | ½ cup rye flour + ½ cup potato flour |
| • Corn flour | 1 cup | | **or** |
| • Corn meal | ¾ cup | | ⅔ cup rye flour + ⅓ cup potato flour |
| • Potato starch flour | ⅝ cup | | **or** |
| • Rolled oats | 1⅓ cup | | ⅝ cup rye flour + ⅓ cup rye flour |
| • Rice flour | 1¼ cup | | (10 tablespoons) |
| • Rye flour | 1¼ cup | | **or** |
| • Rye meal | 1 cup | | 1 cup soy flour + ¾ cup potato starch flour |

# Detect Salt

Salt—the traditional seasoning of choice—has been linked to high blood pressure. Eat no more than 2300 mg/day or no more than 700 milligrams (mg.) per meal. For persons with hypertension or those who are more sensitive to the effects of sodium (such as blacks and middle-aged and older adults), eat even less sodium during the day (around 1500 milligrams) as advised by the recommended Dietary Guidelines, 2005.

**Have you been told to cut down on sodium?** Then you will find the information on labels very helpful. When you're buying packaged foods, always check the labels to make sure the product does not contain too much sodium.

**Do you know what to look for to help you cut sodium in your meal plan when selecting foods in the grocery store?** Here's how you do it. Select single foods with no more than 400 milligrams of sodium in a single serving; entrees should have no more than 800 milligrams of sodium.

As a result of many people needing to reduce the sodium content of their meals, many no-salt and low-salt seasoning mixes are now on the market. Also, by using the following herb and spice guides and recipes for low-sodium seasonings, you can make them at home.

## Herb and Spice Guide

Spices and herbs can be used to enhance the flavor of a fat- or sodium-reduced food. Experiment with small amounts to find an acceptable seasoning level. Powdered herbs are stronger than crumbled, and dried herbs are stronger than fresh herbs. If a recipe calls for ¼ teaspoon powdered herb, you can use ¾ to 1 teaspoon crumbled or flaked, or 2 teaspoons fresh herb.

### What's the Difference between an Herb and a Spice?

- Herb (ûrb,hûrb) n. leaves of plants and shrubs with non-woody stems
- Spice (spis) n. comes from bark, roots, fruit, seeds, or flowers of plants

When adding herbs or spices, take a tip from professional recipe developers. Start with 1 teaspoon of a mild herb (dried) or spice (such as oregano, basil, cumin, and cinnamon) per six servings. Use only ¼ teaspoon of a strong herb or spice (such as rosemary, cloves, nutmeg, ginger, mustard, allspice) per six servings. Try these herbs and spices with the following foods:

**Beef (see also Meat Loaf):** allspice, basil bay leaf, caraway seed, chervil, chili powder, cinnamon, cloves, coriander, cumin, curry powder, dill, fennel, garlic, ½ Greek seasoning to ½ pepper, ginger, lemon pepper, marjoram, oregano, paprika, pepper, rosemary, savory, tarragon

**Breads:** anise, caraway seed, cardamom, cinnamon, coriander, dill, fennel, nutmeg, parsley, poppy seed

**Cheeses:** basil, caraway seed, cayenne, celery seed, chervil, chives, coriander, cumin, dill, jalapeño pepper, marjoram, oregano, parsley, pepper, sage, thyme

**Dips:** cayenne, chili powder, chives, curry powder, dill, oregano, parsley, pepper, sage

**Eggs:** basil, cayenne, celery seed, chervil, chili powder, chives, cumin, curry powder, dill, marjoram, mustard seed, oregano, paprika, parsley, pepper, rosemary, saffron, sage, savory, tarragon, thyme, turmeric

**Fish:** basil, bay leaf, cayenne, celery seed, chervil, cumin, curry powder, dill, ginger, lemon pepper, marjoram, mustard seed, oregano, paprika, parsley, pepper, saffron, sage, savory, tarragon, thyme, turmeric

**Fruits:** allspice, anise, basil, cardamom, cinnamon, cloves, curry powder, fennel, ginger, mace, mint, nutmeg, rosemary

**Grains:** basil, celery seed, chili powder, cumin, curry powder, dill, marjoram, mint, oregano, parsley, pepper, rosemary, saffron, savory, thyme

**Jams and Jellies:** allspice, bay leaf, cardamom, cinnamon, mace, mint, nutmeg

**Lamb:** basil, bay leaf, chervil, cinnamon, cloves, cumin, curry powder, dill, garlic cloves, lemon pepper, marjoram, mint, nutmeg, oregano, parsley, pepper, rosemary, saffron, sage, savory, thyme

**Lentils:** basil, bay leaf, caraway seed, chives, tarragon, thyme, turmeric

**Liver:** basil, bay leaf, caraway seed, chives, tarragon, thyme, turmeric

**Marinades:** allspice, bay leaf, cayenne, celery seed, chili powder, cloves, ginger, mustard seed, oregano, parsley, rosemary, tarragon, turmeric

**Meat Loaf:** chili powder, cumin, curry powder, marjoram, nutmeg, oregano, parsley, pepper, sage, savory, thyme

**Pasta:** basil, oregano, parsley, pepper, poppy seed

**Pickled vegetables:** allspice, bay leaf, cardamom, cinnamon, cloves, coriander, dill, ginger, mint, mustard seed, pepper, tarragon, turmeric

**Pork:** allspice, basil, bay leaf, caraway seed, chervil, cinnamon, cloves, coriander, fennel, ginger, marjoram, nutmeg, pepper, rosemary, sage, savory, thyme

**Poultry:** basil, bay leaf, chervil, coriander, curry powder, dill, ginger, lemon pepper, marjoram, paprika, parsley, pepper, rosemary, saffron, sage, savory, tarragon, thyme, turmeric

**Relishes:** allspice, cayenne, chili powder, cloves, coriander, ginger, mace, tarragon

**Salad Dressings:** caraway seed, celery seed, chervil, chili powder, chives, coriander, curry powder, dill, ginger, mint, mustard seed, paprika, parsley, pepper, poppy seed, tarragon, turmeric

**Shellfish:** basil, bay leaf, cayenne, curry powder, marjoram, oregano, paprika, parsley, saffron, sage, savory, tarragon, thyme

**Soups and Stews:** allspice, basil, bay leaf, caraway seed, cayenne, celery seed, chervil, chili powder, chives, cloves, coriander, curry powder, dill, ginger, marjoram, oregano, paprika, parsley, pepper, rosemary, saffron, tarragon, thyme

**Stuffings:** basil, marjoram, oregano, pepper, rosemary, sage, savory, tarragon, thyme

## Vegetables:

**Artichoke:** bay leaf, coriander, parsley, savory, thyme

**Asparagus:** chives, lemon pepper, marjoram, mustard seed, parsley, tarragon, thyme, turmeric

**Beans, dried:** allspice, bay leaf, celery seed, chili powder, cloves, cumin, jalapeño pepper, mint, mustard seed, oregano, sage, savory, tarragon, turmeric

**Beans, lima:** cumin, dill, marjoram, mustard seed, oregano, sage, savory, tarragon, thyme

**Beans, snap:** basil, caraway seed, chili powder, dill, marjoram, mustard seed, savory, tarragon, thyme

**Beets:** allspice, anise, bay leaf, caraway seed, cinnamon, dill, fennel, ginger, mustard seed, savory, tarragon, thyme

**Broccoli:** caraway seed, dill, mustard seed, oregano, tarragon

**Brussels sprouts:** basil, caraway seed, dill, mustard seed, sage, thyme

**Cabbage:** caraway seed, celery seed, cumin, dill, fennel, mustard seed, nutmeg, oregano, paprika, savory, tarragon, turmeric

**Carrots:** allspice, anise, bay leaf, caraway seed, cinnamon, cloves, dill, fennel, ginger, mace, marjoram, mint, nutmeg, parsley, rosemary, sage, thyme

**Cauliflower:** caraway seed, celery seed, coriander, dill, mace, nutmeg, paprika, parsley

**Corn:** chili powder, chives, oregano, parsley, sage, savory

**Cucumber:** basil, chives, cinnamon, cloves, dill, mint, parsley, pepper, tarragon

**Eggplant:** basil, marjoram, oregano, parsley, sage, thyme

**Greens, dark leafy:** allspice, basil, mace, marjoram, nutmeg, oregano, tarragon

**Greens, salad:** basil, celery seed, chervil, chives, dill, lemon pepper, marjoram, oregano, parsley, pepper, sage, savory, tarragon

**Mushrooms:** chives, dill, marjoram, parsley, tarragon, thyme

**Onions:** caraway seed, curry powder, mustard seed, nutmeg, oregano, parsley, sage, thyme, turmeric

**Parsnips:** chervil, dill, marjoram, parsley, rosemary, sage, thyme

**Peas:** allspice, basil, chervil, chives, dill, marjoram, mint, oregano, poppy seed, rosemary, sage, savory, tarragon, thyme

**Potatoes, sweet:** allspice, cardamom, cinnamon, cloves, ginger, mace, nutmeg

**Potatoes, white:** basil, bay leaf, caraway seed, celery seed, chives, dill, lemon pepper, mustard seed, oregano, parsley, pepper, poppy seed, rosemary, savory, tarragon, thyme

**Pumpkin:** allspice, cardamom, cinnamon, cloves, ginger, mace, nutmeg

**Squash, summer:** chervil, lemon pepper, marjoram, parsley, pepper, savory

**Squash, winter:** allspice, basil, cardamom, cinnamon, cloves, fennel, ginger, mace, mustard seed, nutmeg, rosemary

**Squash, zucchini:** lemon pepper, marjoram, oregano, parsley

**Tomatoes:** basil, bay leaf, celery seed, chervil, chili powder, dill, lemon pepper, oregano, parsley, sage, savory, tarragon, thyme

**Turnips:** allspice, dill, mace, nutmeg, paprika, thyme

**Vegetable juices:** basil, bay leaf, oregano, parsley, pepper, tarragon

## Seasonings without Salt

One teaspoon of salt has about 2,000 mg of sodium. Substantially reduce your sodium intake by substituting. Any of the following seasonings can be used.

**Zesty Herb Seasoning**
**Sodium**: 47 milligrams per teaspoon

Grated peel of 1 lemon
2 tablespoons ground cinnamon
1 tablespoon ground mace
1 tablespoon dried basil leaves, crushed
1 tablespoon dried thyme leaves, crushed
1 tablespoon dried rosemary leaves, crushed
2 teaspoons paprika
1 teaspoon salt and potassium chloride mixture (a purchased product with half the sodium of table salt)
1 teaspoon pepper
1 teaspoon ground cloves
½ teaspoon ground nutmeg
½ teaspoon ground allspice

1. Combine all ingredients. Refrigerate in covered container.
2. Sprinkle as desired over meat, poultry, or fish before broiling or baking.

**Oriental Spice**
**Sodium:** About 1.6 milligrams per teaspoon

1 teaspoon fresh grated lemon peel
¼ teaspoon anise seed, crushed
¼ teaspoon fennel seed, crushed
¼ teaspoon ground cinnamon
¼ teaspoon ground cloves
¼ teaspoon ground ginger

1. Combine all ingredients. Refrigerate in covered container.
2. To use, sprinkle as desired over poultry or meat stir-fry dishes.

**Herbed Seasoning**
**Sodium:** 0.65 milligrams per teaspoon

2 tablespoons dried dill weed or basil leaves, crumbled
2 tablespoons onion powder
1 teaspoon dried oregano leaves, crumbled
1 teaspoon dried celery seed
½ teaspoon lemon pepper (sodium-free)

1. Combine all ingredients in small bowl and blend well.
2. Spoon into shaker and use with poultry and fish.
3. Store in cool, dry place.

**Spicy Blend**
**Sodium:** 0.59 milligram per teaspoon

2 tablespoons dried savory, crushed
1 tablespoon dry mustard
2½ teaspoons onion powder
1¾ teaspoons curry powder
1¼ teaspoons ground pepper
1¼ teaspoons ground cumin
½ teaspoons garlic powder

1. Mix thoroughly and place in shaker. Store in cool, dry place.
2. Use with main dishes.

**Shaker Spice Blend**
**Sodium:** 1.78 milligrams per teaspoon

5 teaspoons onion powder
2½ teaspoons garlic powder
2½ teaspoons paprika
2½ teaspoons dry mustard
1¼ teaspoons thyme leaves, crushed
½ teaspoon ground pepper
¼ teaspoon celery seed

1. Mix thoroughly and place in shaker.
2. Use at table on main dishes, vegetables, soups or salads.

## Did You Know?

Health professionals recommend a daily sodium intake below 2,300 milligrams (mg). About one third of the average intake of sodium comes from salt added to food during cooking or at the table. Read the ingredients listing and nutrition information on food labeling in all processed food.

# Modifying Recipes

| Reason for ingredient | | Amount usually used | Result of reducing ingredient |
|---|---|---|---|
| **Candies** | | | |
| Fat | Adds to rich flavor and helps prevent large crystals from forming. | Amount varies widely. | May be coarser in texture. |
| Sugar | Needed for crystallization, proper consistency, texture, and flavor. | About 3 cups sugar per cup liquid. | Do not change recipe. May drastically affect the volume, texture, and consistency. |
| Salt | Helps balance and round out the flavor. | Amount varies widely. | May change flavor. |
| **Cakes** | | | |
| Fat | Contributes to tenderness, fine grain, and texture. | 2 to 4 tablespoons fat per cup of flour. | May seem less moist and flavorful. |
| Sugar | Contributes to tenderness, flavor, texture, moistness, and browning. | ½ to 1⅓ cup sugar per cup of flour | Flavor may be less sweet; becomes stale faster. May have paler crust, less color, more open texture, more rounded top, and be drier. |
| Salt | Adds flavor. | Variable. | Little effect. |
| **Canned and Frozen Fruit** | | | |
| Sugar | Helps to preserve firm texture and bright color. | ½ to 1⅓ cups sugar per cup water for syrup; ¼ to ⅓ cup sugar per pint of frozen fruit (dry pack). | Texture may be less firm. Flavor may be less sweet. Color may be less bright. |
| **Canned Vegetables** | | | |
| Salt | Adds flavor. | 1 teaspoon salt per quart. | Flavor may change. |
| **Cooked Fruits** | | | |
| Sugar | Helps retain fruit shape and texture during cooking. Increases transparency so brighter. | ½ cup sugar per cup water (too much sugar causes fruits to shrink and become firm). | Texture likely to be softer; color likely to be less bright; flavor will be less sweet. |
| **Cookies** | | | |
| Fat | Increases tenderness. | ¼ to ½ cup fat per cup flour. | May make cookies less tender. |
| Sugar | Contributes to sweetness, browning, and tenderness. Melts during baking so cookie spreads out. | ⅓ to 1⅓ cups sugar per cup flour. | Flavor will be less sweet; cookie will be tougher and paler. With less sugar to melt, cookie won't spread as much. |
| Salt | Adds flavor. | ¼ to ½ teaspoon salt per cup flour. | May alter flavor slightly. |

| Reason for ingredient | | Amount usually used | Result of reducing ingredient |
|---|---|---|---|
| **Custards and Puddings** | | | |
| Fat | Causes eggs to coagulate at higher temperature so consistency is softer. | 1½ to 3 tablespoons sugar per cup milk. | Consistency will be firmer, and baking time may be shorter. |
| Salt | Adds flavor. | ⅛ teaspoon salt per cup milk. | Flavor may change. |
| **Ice Cream** | | | |
| Fat | Fat (in cream) helps make a smooth texture and aids incorporation of air during freezing; also gives a rich flavor. | Liquid is usually about half milk and half cream. | Using a milk product that is lower in fat reduces the richness, creaminess, and smoothness of the ice cream. |
| Sugar | Lowers freezing point and lengthens freezing time so ice cream will be softer at a given temperature. Contributes to smooth texture. Adds sweetness. | ½ cup sugar to each cup of milk or cream. | Texture may be coarser. Ice cream will be harder and less sweet. Freezing time will be shorter. |
| Salt | Adds flavor. | Amount varies. | Little effect. |
| **Main Dishes** | | | |
| Salt | Adds flavor. | 1 teaspoon salt per 4 to 6 servings. 1 teaspoon salt to each pound ground beef. | Little effect. |
| **Pasta, Rice, Legumes** | | | |
| Salt | Adds flavor. | 1 teaspoon salt to each cup of uncooked pasta, rice, legumes. | May change flavor. |
| **Pickles** | | | |
| Sugar | Contributes to crisp texture. May act as a preservative if enough is used. | Highly variable | Never change recipe. May cause texture changes and/or spoilage. |
| Salt | Essential in brine to permit growth of desirable micro-organisms and produce acid for preventing spoilage. | Highly variable | Never change recipe. May cause texture changes and/or spoilage. |
| **Quick Breads** | | | |
| Fat | Increases tenderness. | 1 to 4 tablespoons fat per cup of flour. | May be less tender and less moist. |
| Sugar | Contributes to sweetness, tenderness, browning, moistness, and volume. | 1 to 4 tablespoons sugar per cup of flour. | May result in a less sweet, less tender product with a greater tendency to dry out. |
| Salt | Adds flavor. | ¼ to ½ teaspoon salt per cup of flour. | May affect flavor slightly. |

| Reason for ingredient | | Amount usually used | Result of reducing ingredient |
|---|---|---|---|
| **Sauces and Gravies** | | | |
| Fat | Separates the flour or starch granules to prevent lumpiness. | 1 to 3 tablespoons fat per cup liquid. | Smooth sauces can be made with less fat. If no fat is used, blend starch or flour with cold liquid. Flavor will be milder. |
| Salt | Adds flavor. | ¼ teaspoon salt per cup liquid. | Little effect. |
| **Sweet Spreads (Jellies, Jams, Preserves, Butters)** | | | |
| Sugar | Essential for jelling and protecting against spoilage. | Highly variable. | Do not change recipes for sweet spreads unless they are to be frozen or refrigerated. They are carefully balanced to produce a high-quality product that will not spoil. |
| **Yeast Breads and Rolls** | | | |
| Fat | Increases tenderness and enhances keeping quality. Large amounts decrease volume. | 1 to 3 teaspoons fat per cup of flour in bread; 1 to 4 tablespoons fat per cup flour in rolls. | May reduce keeping quality. |
| Sugar | Contributes to a soft texture, sweet flavor, and brown crust. Provides food for yeast during fermentation. Small amounts of sugar increase the rate of fermentation; large amounts of sugar depress yeast action. | Up to 1 tablespoon sugar per cup of flour in bread; ½ to 2 tablespoons sugar per cup flour in rolls. | May affect rate of fermentation.<br>May not be as tender or moist. Rolls may not brown as quickly. |
| Salt | Inhibits yeast fermentation. Improves texture. Adds flavor. Has a slight toughening effect on the gluten. | ¼ to ½ teaspoon salt per cup flour. | May cause yeast to grow too rapidly, resulting in a poor texture. Satisfactory bread needs some salt. |

# Revising Recipes

The first point to remember when revising recipes is that all changes for modifying recipes are experiments. Some work very well. Others are less satisfactory. Reviewing the guidelines on the previous pages will help you understand some of the chemistry involved in using specific ingredients in certain types of recipes. The following examples show how some ingredients can be reduced or changed to produce a product that is healthier. The decision of whether or not to change a recipe instead of serving it less frequently or in smaller portions is your choice.

## Grandma's Meatballs

Changing ingredients as well as the cooking method makes a difference here. Using less total meat provides an adequate 3-ounce cooked serving (instead of 5 ounces).

| **Original** | **Revised** |
|---|---|
| 2 pounds 85% lean ground beef | 1½ pounds extra lean ground beef |
| ½ cup chopped onion | ½ cup chopped onion |
| 2 eggs | 2 egg whites |
| ¼ cup milk | ¼ cup skim milk |
| ½ cup rolled oats | ½ cup rolled oats |
| ½ teaspoon ground allspice | ½ teaspoon ground allspice |
| salt and pepper to taste | salt and pepper to taste |
| Omit or use less butter for frying | 1 teaspoon cooking oil or pan spray |

In large bowl, mix all ingredients except oil. Shape into 12 meatballs. Place on boiler pan or shallow baking pan that has been sprayed with nonstick spray coating. Bake at 325 °F until browned, or cook in skillet. Serve with rice, pasta, or potatoes.

**Yield:** 6 servings

**Approximate nutritional values per serving:**

| | |
|---|---|
| 352 calories | 210 calories |
| 21 grams fat | 8 grams fat |
| 54% calories from fat | 5% calories from fat |
| 172 mg cholesterol | 66 mg cholesterol |

## Hashed Brown Potato Casserole

Substituting reduced fat ingredients is an easy change to make. Using bran cereal is a way to increase fiber. Avoid using crushed crackers that are likely to have a higher fat content.

| **Original** | **Revised** |
|---|---|
| 2 pounds frozen hash brown potatoes, thawed | 2 pounds frozen hash brown potatoes, thawed |
| ¼ cup chopped onion | ¼ cup chopped onion |
| 1 teaspoon salt | Omit salt |
| ¼ teaspoon pepper | ¼ teaspoon pepper |
| 8 ounces cheddar cheese, shredded | 8 ounces reduced fat cheddar cheese, shredded |
| 8 ounces dairy sour cream | 8 ounces light dairy sour cream |

| | |
|---|---|
| 1 can cream of chicken soup | 1 can cream of chicken soup (99% fat free) |
| ½ cup corn flake crumbs | ½ cup crushed bran cereal |
| 2 tablespoons butter | Omit butter |

Spray a 13×9×2-inch baking pan with non-stick spray coating. Add thawed potatoes, onion, and pepper. Combine cheese, sour cream, and soup; stir into potato mixture. Sprinkle crushed cereal over the top. Bake, covered at 350 °F for 50 minutes.

**Yield**: 12 servings

**Approximate nutritional values per serving:**

| | |
|---|---|
| 225 calories | 166 calories |
| 14 grams fat | 6 grams fat |
| 54% calories from fat | 29% calories from fat |
| 36 mg cholesterol | 18 mg cholesterol |

### Did You Know?

When using a regular — not lite or microwave variety — brownie or cake mix, substitute ½ cup plain non-fat yogurt for the 2 eggs and ½ cup oil to cut down on fat.

## Brownies

Serving size and frequency of eating are important factors in deciding when to change sweet baked products. This example offers the alternative of replacing margarine with applesauce.

| **Original** | **Moderate** | **Low Fat** |
|---|---|---|
| ½ cup margarine | ¼ cup margarine | Omit |
| | ¼ cup unsweetened applesauce | ½ cup unsweetened applesauce |
| 1 cup sugar | 1 cup sugar | 1 cup sugar |
| 1 egg | 1 egg | 2 egg whites |
| 1 teaspoon vanilla | 1 teaspoon vanilla | 1 teaspoon vanilla |
| ¾ cup flour | ¾ cup flour | ¾ cup flour |
| ¼ cup cocoa | ¼ cup cocoa | ¼ cup cocoa |
| ¼ teaspoon baking powder | ¼ teaspoon baking powder | ¼ teaspoon baking powder |
| ⅛ teaspoon salt | ⅛ teaspoon salt | ⅛ teaspoon salt |
| ½ cup chopped Texas pecans | ¼ cup chopped Texas pecans | Omit Omit |

Spray a 9×9×2-inch baking pan with nonstick spray coating; set aside. In mixer bowl, combine applesauce, sugar, egg whites, and vanilla. Stir in flour, cocoa, baking powder, and salt. Pour into pan and bake at 350 °F for 20 to 25 minutes.

**Yield:** 16 servings

**Approximate nutritional values per serving:**

| | | |
|---|---|---|
| 153 calories | 117 calories | 78 calories |
| 9 grams fat | 5 grams fat | 0.2 grams fat |
| 49% calories from fat | 34% calories from fat | 3% calories from fat |
| 13 mg cholesterol | 13 mg cholesterol | 0 mg cholesterol |

## Homemade Ice Cream

**Safety First:** This is a typical cooked custard ice cream because the egg mixture is cooked before freezing. The cooking step will destroy any salmonella bacteria that might be present in raw eggs. If your favorite homemade ice cream recipe uses raw eggs and you don't want to convert it to a cooked custard ice cream, substitute whole liquid pasteurized eggs available from some supermarkets.

| **Original** | **Lower Fat** |
|---|---|
| 2 cups sugar | 2 cups sugar |
| ¼ cup cornstarch | ¼ cups cornstarch |
| ¼ teaspoon salt | ¼ teaspoon salt |
| 4 cups whole milk | 4 cups 2 percent milk |
| 4 eggs, beaten | 4 eggs, beaten |
| 2 tablespoons vanilla | 2 tablespoons vanilla |
| 4 cups whipping cream | 4 cups half and half |

Mix sugar, cornstarch, and salt in the top of a double boiler. Gradually blend in 4 cups milk. Cook over hot water, stirring occasionally until thickened, 12–15 minutes. Stir in a small amount of the hot cornstarch mixture into the beaten eggs; then stir the eggs into the remaining cornstarch mixture. Continue cooking, stirring constantly 4–5 minutes longer, or until the mixture is about the consistency of pudding. Chill thoroughly. This step is essential for a smooth ice cream. Stir in vanilla and remaining milk or cream. Pour into a 1 gallon ice cream freezer and freeze according to manufacturer's directions. Remove the dasher; add mixture of ice and salt to freezer, if needed, cover with heavy blanket and allow ice cream to harden about 2 hours.

**Yield:** About 1 gallon in a standard ice cream freezer, 32 ½-cup servings.

**Approximate nutritional values per serving:**

| | |
|---|---|
| 182 calories | 115 calories |
| 13 grams fat | 5 grams fat |
| 61% calories from fat | 36% calories from fat |
| 72 mg cholesterol | 41 mg cholesterol |

## Pumpkin Bread

This recipe can also be baked in two mini-loaf pans (check for doneness after 50 minutes).

| **Original** | **Moderate Fat** | **Low Fat** |
|---|---|---|
| ¾ cup pumpkin | 1 cup pumpkin | 1 cup pumpkin |
| ½ cup sugar | 1 cup sugar | ½ cup sugar |
| ½ cup vegetable oil | ⅓ cup vegetable oil | 2 tablespoons vegetable oil |
| 1 egg white | 1 egg white | 2 tablespoons plain lowfat yogurt |

| | | |
|---|---|---|
| 1 cup all-purpose flour | ¾ cup all-purpose flour | ¾ cup all-purpose flour |
| ½ cup whole wheat flour | ¾ cup whole wheat flour | ¾ cup whole wheat flour |
| 1 teaspoon baking powder | 1 teaspoon baking powder | 1 teaspoon baking powder |
| 1 teaspoon baking soda | 1 teaspoon baking soda | 1 teaspoon baking soda |
| 1 teaspoon ground cinnamon | 1 teaspoon ground cinnamon | 1 teaspoon ground cinnamon |
| ¼ teaspoon salt | ¼ teaspoon salt | ¼ teaspoon salt |
| ½ cup chopped nuts | ½ cup raisins | ½ cup raisins |

In large mixer bowl, beat together pumpkin, sugar, oil, and eggs or yogurt. In a medium bowl, combine the flours, baking powder, baking soda, cinnamon, and salt. Add to pumpkin mixture, stirring just until moistened. Stir in the nuts or raisins. Pour into a greased 9×5×3-inch loaf pan. Bake in preheated 350 °F oven for about 1 hour, or until a wooden toothpick inserted near the center comes out clean. Cool on a wire rack for 10 minutes; remove from the pan and cool completely.

**Yield**: 16 slices

**Approximate nutritional value per slice:**

| | | |
|---|---|---|
| 155 calories | 127 calories | 105 calories |
| 9 grams fat | 5 grams fat | 3 grams fat |
| 53% calories from fat | 32% calories from fat | 17% calories from fat |
| 0 mg cholesterol | 0 mg cholesterol | 0 mg cholesterol |

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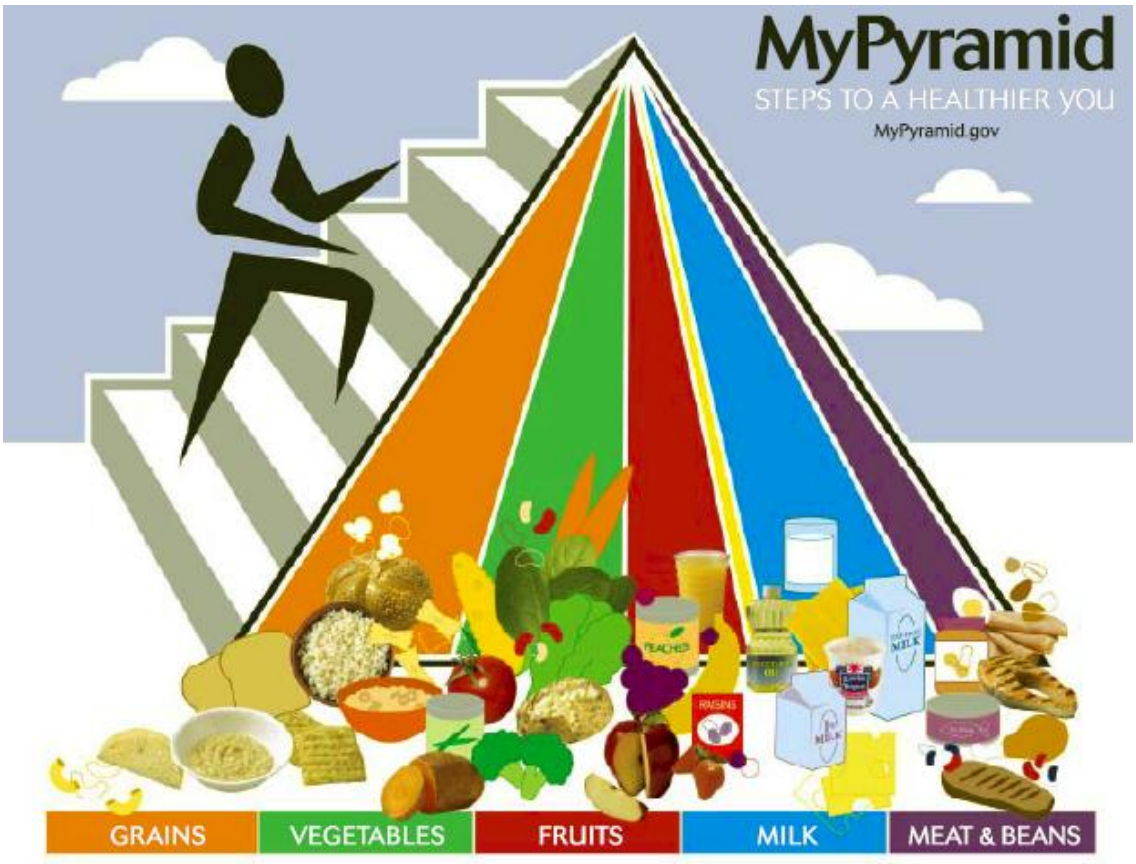
## Did You Know?

Comparing numbers — of calories and grams of fat or fiber, for example — is one way to select which foods to eat. But specific numbers fail to reflect flavor, cost, or individual status. Healthy eating means learning to balance both the variety and quantity of foods eaten over several days.

# MyPyramid.gov Tips & Resources




Information on the MyPyramid.gov website will help you use the newly revised MyPyramid so you can make the right food and physical activity choices each day, which affect your health—how you feel today, tomorrow, and in the future.

Go to the website http://www.mypyramid.gov/tips_resources/index.html to find a wealth of suggestions on how to get started toward a healthy diet recommended by the 2005 Dietary Guidelines:

- emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products;
- includes lean meats, poultry, fish, beans, eggs, and nuts; and
- is low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars.

The recommendations in the Dietary Guidelines and in MyPyramid are for the general public over 2 years of age. MyPyramid is not a therapeutic diet for any specific health condition. Individuals with a chronic health condition should consult with a health care provider to determine what dietary pattern is appropriate for them.

Adapted from the MyPyramid.gov USDA website: http://www.mypyramid.gov/guidelines/index.html.

# Additional Information

**Research-based information and/or publications that may be available at local county Texas AgriLife Extension Service offices:**

- Dietary Guidelines for Americans, 2004
- Food Allergies Bulletin, Texas AgriLife Extension Service
- Special Food Needs Dietary Guide, D-1284, 2005
- The Sodium Content of Your Food, B-1400, 2003
- USDA's MyPyramid.gov, 2005
- Nutrient Needs at a Glance, L-1875 (English/Spanish), 2005

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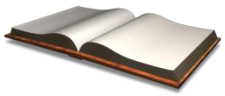


**For Cookbooks and Recipes for Specific Conditions:**

- American Diabetes Association 1-800-232-3472 or 1-800-432-3472 http://www.diabetes.org
- American Dietetic Association 1-800-366-1655 http://www.eatright.org
- American Heart Association AHA: 1-800-AHA-USA-1 or 1-800-242-8721 http://www.americanheart.org/

# Cooking Food Safely is a Matter of Degrees

Each year, 1 out of every 4 people gets sick from harmful bacteria (germs) in food. Cooking foods to a safe internal temperature can lower your chance of getting sick. You cannot tell if a food is "done" just by the way it looks. The only way to tell that food is cooked properly is by checking the temperature with a food thermometer.

**How To Use a Food Thermometer** Use an instant-read food thermometer to check the internal temperature near the end of cooking time, but before the food is expected to be "done." Always follow the instructions that come with your food thermometer.

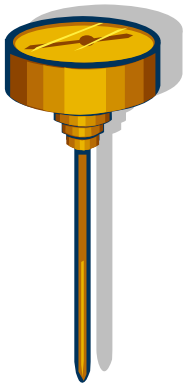
Place the thermometer in the thickest part the food. Do not let it touch bone, fat, or gristle.

Compare your thermometer reading to the recommended minimum temperatures to see if your food has reached a safe temperature.

If the food has not reached a minimum temperature, keep cooking for a while longer and check the temperature again. Always clean the thermometer with hot, soapy water **before and after each use**.

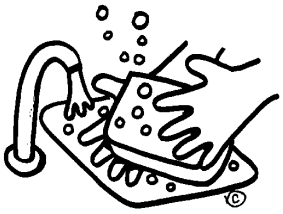
## USDA Recommended Safe Minimum Internal Temperatures

Steaks & Roasts - 145 °F
Fish - 145 °F
Pork - 160 °F
Ground Beef - 160 °F
Egg Dishes - 160 °F
Chicken Breasts - 165 °F
Whole Poultry - 165 °F
Leftovers -165 °F
Stuffing - 165 °F
Hotdogs - 165 °F

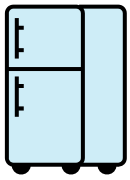


## Other ways to reduce foodborne illness:

**CLEAN:** Wash hands with warm, soapy water for 20 seconds before and after handling food. Wash cutting boards, dishes, and utensils with hot, soapy water after preparing each food item. Wash raw fruits and vegetables with cold waterbefore using. You do not need to wash or rinse meat or poultry.



**SEPARATE:** Don't cross-contaminate. Separate raw, cooked, and ready-to-eat foods when shopping, preparing food, or storing. Never place cooked food on a plate which previously held raw meat, poultry, or seafood.



**CHILL:** Refrigerate or freeze perishable and prepared foods, and leftovers within 2 hours or sooner.

**Source:** Adapted from "*Is it Done Yet*?" by the USDA Food Safety & Inspection Service



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## Be a BAC Fighter

Make the meals and snacks from your kitchen as safe as possible. **CLEAN:** wash hands and surfaces often; **SEPARATE:** don't cross-contaminate; **COOK:** to proper temperatures, and **CHILL:** refrigerate promptly. Be a BAC Fighter and *Fight BAC!®*


***For More Information about Safe Food Handling and Preparation***

USDA's Meat and Poultry Hotline
1-888-MPHotline (1-888-674-6854);
TTY 1-800-256-7072

*www.foodsafety.gov*

***To locate food safety educators in your state or community:***

Cooperative Extension Service, local offices:
www.csrees.usda.gov/Extension/index.html

Food and Drug Administration Public Affairs Specialists:
www.fda.gov/ora/fed_state/dfsr_activities/dfsr_pas.html

**See *www.fightbac.org* for free brochures, fact sheets, stickers, and other great stuff!**

**Sign up to be a BACFighter at www.fightbac.org**

## Apply the heat... and Fight BAC!®

Cooking food to the proper temperature kills harmful bacteria. So *Fight BAC!®* by thoroughly cooking your food as follows:

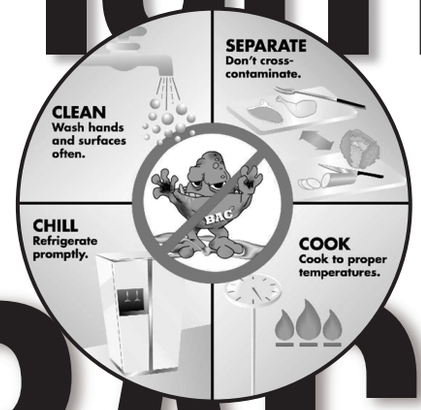
### SAFE COOKING TEMPERATURES

*as measured with a food thermometer*

| | Internal temperature |
|---|---|
| **Ground Meat & Meat Mixtures** | |
| Beef, Pork, Veal, Lamb | 160°F |
| Turkey, Chicken | 165°F |
| **Fresh Beef, Veal, Lamb** | |
| Medium Rare | 145°F |
| Medium | 160°F |
| Well Done | 170°F |
| **Poultry** | |
| Chicken & Turkey, whole | 165°F |
| Poultry parts | 165°F |
| Duck & Goose | 165°F |
| Stuffing (cooked alone or in bird) | 165°F |
| **Fresh Pork** | |
| Medium | 160°F |
| Well Done | 170°F |
| **Ham** | |
| Fresh (raw) | 160°F |
| Pre-cooked (to reheat) | 140°F |
| **Eggs & Egg Dishes** | |
| Eggs | Cook until yolk & white are firm |
| Egg dishes | 160°F |
| **Seafood** | |
| Fin Fish | 145°F or flesh is opaque & separates easily with fork |
| Shrimp, Lobster & Crabs | flesh pearly & opaque |
| Clams, Oysters & Mussels | Shells open during cooking |
| Scallops | milky white or opaque & firm |
| **Leftovers & Casseroles** | 165°F |

2005 PFSE

# FIGHT BAC!®




**FIGHT** FOODBORNE BACTERIA

Four Simple Steps to

## Food Safety

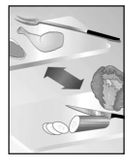

BAC (foodborne bacteria) could make you and those you care about sick. In fact, even though you can't see BAC—or smell him, or feel him—he and millions more like him may have already invaded the food you eat. But you have the power to *Fight BAC!®*.

Foodborne illness can strike anyone. Some people are at a higher risk for developing foodborne illness, including pregnant women, young children, older adults and people with weakened immune systems. For these people the following four simple steps are critically important:

## CLEAN: *Wash hands and surfaces often*

Bacteria can be spread throughout the kitchen and get onto hands, cutting boards, utensils, counter tops and food. To *Fight BAC!®*, always:

- Wash your hands with warm water and soap for at least 20 seconds before and after handling food and after using the bathroom, changing diapers and handling pets.
- Wash your cutting boards, dishes, utensils and counter tops with hot soapy water after preparing each food item and before you go on to the next food.
- Consider using paper towels to clean up kitchen surfaces. If you use cloth towels wash them often in the hot cycle of your washing machine.
- Rinse fresh fruits and vegetables under running tap water, including those with skins and rinds that are not eaten.
- Rub firm-skin fruits and vegetables under running tap water or scrub with a clean vegetable brush while rinsing with running tap water.



## SEPARATE: *Don't cross-contaminate*

Cross-contamination is how bacteria can be spread. When handling raw meat, poultry, seafood and eggs, keep these foods and their juices away from ready-to-eat foods. Always start with a clean scene— wash hands with warm water and soap. Wash cutting boards, dishes, countertops and utensils with hot soapy water.

- Separate raw meat, poultry, seafood and eggs from other foods in your grocery shopping cart, grocery bags and in your refrigerator.
- Use one cutting board for fresh produce and a separate one for raw meat, poultry and seafood.
- Never place cooked food on a plate that previously held raw meat, poultry, seafood or eggs.

## COOK: *Cook to proper temperatures*

Food is safely cooked when it reaches a high enough internal temperature to kill the harmful bacteria that cause illness. Refer to the chart on the back of this brochure for the proper internal temperatures.

- Use a food thermometer to measure the internal temperature of cooked foods. Make sure that meat, poultry, egg dishes, casseroles and other foods are cooked to the internal temperature shown in the chart on the back of this brochure.
- Cook ground meat or ground poultry until it reaches a safe internal temperature. Color is not a reliable indicator of doneness.
- Cook eggs until the yolk and white are firm. Only use recipes in which eggs are cooked or heated thoroughly.
- When cooking in a microwave oven, cover food, stir and rotate for even cooking. Food is done when it reaches the internal temperature shown on the back of this brochure.
- Bring sauces, soups and gravy to a boil when reheating.

## CHILL: *Refrigerate promptly*

Refrigerate foods quickly because cold temperatures slow the growth of harmful bacteria. Do not over-stuff the refrigerator. Cold air must circulate to help keep food safe. Keeping a constant refrigerator temperature of 40ºF or below is one of the most effective ways to reduce the risk of foodborne illness. Use an appliance thermometer to be sure the temperature is consistently 40ºF or below. The freezer temperature should be 0ºF or below.

- Refrigerate or freeze meat, poultry, eggs and other perishables as soon as you get them home from the store.
- Never let raw meat, poultry, eggs, cooked food or cut fresh fruits or vegetables sit at room temperature more than two hours before putting them in the refrigerator or freezer (one hour when the temperature is above 90ºF).
- Never defrost food at room temperature. Food must be kept at a safe temperature during thawing. There are three safe ways to defrost food: in the refrigerator, in cold water, and in the microwave. Food thawed in cold water or in the microwave should be cooked immediately.
- Always marinate food in the refrigerator.
- Divide large amounts of leftovers into shallow containers for quicker cooling in the refrigerator.
- Use or discard refrigerated food on a regular basis. Check USDA cold storage information at ***www.fightbac.org*** for optimum storage times.

Texas Cooperative EXTENSION
The Texas A&M University System

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# Nutrient Needs at a Glance

Extension Nutrition Specialists
The Texas A&M University System

## Glossary

**Adequate Intake (AI):** sometimes used in place of RDA

**Anorexia:** loss of appetite

**Antioxidant:** a substance that prevents the deterioration or rancidity of fats

**Ataxia:** inability to coordinate voluntary muscles

**Cachexia:** general physical wasting and malnutrition

**Cheilosis:** cracks at the corner of the mouth

**Coenzyme:** compound that forms the actual part in an enzyme after combining with a protein component

**Daily Values: (DVs):** the amount of a nutrient needed daily as determined by the Food and Drug Administration (FDA)

**Dermatitis:** inflammation of the skin

**Desquamation:** loss of a layer of skin

**Eczema:** an inflammatory condition of the skin characterized by redness and itching

**Edema:** abnormal accumulation of fluid in the body

**Glucose Tolerance Factor (GTF):** a dietary agent that facilitates the reaction of insulin

**Hemorrhagic:** loss of blood from blood vessels

**Ketosis:** a condition caused by abnormal burning of fat in the body

**Microgram (mcg):** one millionth of a gram

**Milligram (mg):** one thousandth of a gram

**Neural Tube Defects (NTD):** birth defects due to failure of the neural tube to develop properly during fetal development

**Osteomalacia:** softening of bones in adults

**Osteoporosis:** porous, brittle bones

**Photophobia:** sensitivity to light

**Recommended Dietary Allowances (RDA):** the amount of nutrients needed to promote good growth and optimum health in people ages 25 to 50

**Rickets:** bone deformation in children

**Scurvy:** weakened cartilages and connective tissue

**Xerophthalmia:** an eye condition that can lead to blindness

## References

Data compiled Dietary Reference Intakes for Nutrients Reports (*http://nap.edu*), the Food and Nutrition Board, National Academy of Sciences. Washington, DC: National Academy Press, 1997-2002.

Recommended Dietary Allowances, 10th ed. Washington DC: National Academy Press, 1989.
Insel, P., Turner, R. E. Ross, D. Discovering Nutrition, The American Dietetic Association. Boston: Jones and Bartlett Publishers, 2002.

Revised by Mary Kinney Bielamowicz, Professor and Extension Nutrition Specialist, The Texas A&M University System.

# Estimated safe and adequate daily dietary intakes of selected vitamins and minerals

| Nutrient and other associated names | RDA* M[1] | RDA* F[2] | Functions in the body | Sources | Deficiency |
|---|---|---|---|---|---|
| Protein (grams/kilogram (of body weight) | .80 | .80 | • Builds and repairs all body tissue<br>• Helps build blood<br>• Helps form antibodies to fight infection.<br>• Supplies food energy at 4 calories per gram | Animal protein: meat, fish, poultry, eggs, milk, cheese<br>Vegetable protein: peas, beans, bread, cereal, nuts, peanut butter | Fatigue, loss of appetit edema,* poor growth |
| Fat (percentage) of total caloric intake (Acceptable Macronutrient Distribution Range) | 20-35 | 20-35 | • Supplies large amount of energy in a small amount of food<br>• Nine calories per gram supplies essential fatty acids needed for body's proper use and storage of fat | Butter, margarine, shortening, oil, salad dressing, palm and coconut oil, egg yolk, meat with fat, whole milk, cheese, peanut butter | Eczema,* retarded growth, diarrhea, loss of hair |
| Carbohydrates (grams)<br>Median intake | 130**<br>200-330 | 130**<br>180-230 | • Supply energy at 4 calories per gram to all body cells<br>• Helps the body use other nutrients | Breads, cereals, flours, cornmeal, rice, macaroni, noodles, spaghetti, Irish and sweet potatoes, corn, dried fruits, sweetened fruits, bananas, sugar, syrup, jam, jellies, preserves, honey | Loss of energy, fatigue, ketosis* |
| **Water-soluble vitamins** | | | | | |
| Vitamin C (mg)<br>Ascorbic acid | 90 | 75 | • Helps the body maintain collagen (supportive material which gives structure to cells)<br>• Promotes iron absorption<br>• Helps wounds heal | All citrus fruits and juices, strawberries, cantaloupe, tomatoes, green and red peppers, raw cabbage, broccoli, kale, turnip greens, mustard greens, collards, Irish and sweet potatoes, spinach | Scurvy;* sore, bleeding gums; poor wound healing, pain in joints, bones, muscles |
| Vitamin $B_1$ (mg)<br>Thiamin | 1.2 | 1.1 | • Helps the body use carbohydrates for energy<br>• Maintains appetite and muscle tone<br>• Involved in nervous system function | Meat (especially pork), liver, heart, kidney, poultry, eggs, milk, dried peas and beans, nuts, whole-grain or enriched breads and cereals | Poor appetite, constipation, depression, apathy, cachexia,* edema,* cardiac failure, cheilosis* |
| Vitamin $B_2$ (mg)<br>Riboflavin | 1.3 | 1.1 | • Functions as a part of a coenzyme* that assists in energy release<br>• Helps in metabolism of amino acids | Milk, cheese, ice cream, organ meats, eggs, fish, dark green leafy vegetables, enriched breads and cereals | Cheilosis,* scaly desquamation* around nose and ears, sore tongue and mouth, burning and itching eyes, photophobia* |
| Niacin (mg)[3]<br>Nicotinic acid<br>Nicotinamide | 16 | 14 | • Coenzyme* for carbohydrate metabolism<br>• Promotes normal appetite | Meat, liver, poultry, fish, dried peas and beans, nuts (especially peanuts), whole-grain or enriched cereals and breads, milk, cheese, yogurt | Anorexia,* diarrhea dermatitis, confusion, anxiety |
| Vitamin $B_6$ (mg)<br>Three active forms:<br>pyridoxine<br>pyridoxal<br>pyridoxamine | 1.3 | 1.3 | • Coenzyme* for protein utilization<br>• Helps convert the amino acid tryptophan to the vitamin niacin<br>• Helps convert complex carbohydrates to simple carbohydrates | Meat, poultry, fish, sweet potatoes, vegetables, whole grains, fortified cereal | Anemia, nervous irritability, convulsions, weakness, ataxia,* abdominal pain, dermatitis |
| Vitamin $B_{12}$ (mcg)<br>Cyanocobalamin<br>Hydroxocobalamin | 2.4 | 2.4 | • Helps maintain nerve tissue and normal blood formation<br>• Regeneration of folate | Animal foods only: organ meats, muscle meats, fish, poultry, eggs, milk | Anemia, neurologic disorders |
| Folate (mcg)<br>Folic acid, folacin<br>Tetrahydrofolic acid | 400 | 400*** | • Helps red blood cells mature<br>• Interrelated with vitamin $B_{12}$ utilization | Organ meats, deep green leafy vegetables, muscle meats, poultry, fish eggs, whole-grain and fortified cereals | Anemia, gastrointestinal disturbances, fatigue, inadequate intake in early pregnancy related to neural tube birth defects |

| Fat-soluble vitamins | RDA* M[1] | RDA* F[2] | Functions in the body | Sources | Deficiency |
|---|---|---|---|---|---|
| Vitamin A (mcg RAE)[4]<br>Retinol, Retinal<br>Carotene | 900 | 700 | • Promotes growth and normal vision, and protects against night blindness<br>• Helps keep skin and mucous membrane linings healthy and resistant to infection<br>• Large amounts are toxic | Dark green leafy vegetables, deep yellow vegetables (carrots, pumpkin, sweet potatoes, winter squash, cushaw), yellow fruits (peaches, apricots, cantaloupe), fish liver oils, butter, margarine, egg yolks | Faulty bone and tooth development in infants, poor growth, xerophthalmia,* night blindness |
| Vitamin D (mcg)<br>Vitamin $D_2$<br>Ergocalciferol<br>Vitamin $D_3$<br>Cholecalciferol<br>Antirachitic factor | 5 AI | 5 AI | • Synthesized in skin by ultraviolet light<br>• Functions as steroid hormone to regulate calcium and phosphorus absorption, mobilization and mineralization of bone<br>• Large amounts are toxic | Fish-liver oils, fortified milk, exposure to sunlight. Very small amounts in butter, liver, egg yolk, salmon, sardines | Rickets;* soft, fragile bones; enlarged joints; bowed legs; chest, spinal and pelvic bone deformities; convulsions; osteomalacia* |
| Vitamin E (mg)[5]<br>Alpha-, beta-<br>gamma-tocopherol | 15 | 15 | • Not stored in body to any extent<br>• Related to action of selenium<br>• Reduces oxidation of vitamin A, carotenes, and polyunsaturated fatty acids | Plant tissues, vegetable oils, wheat germ, rice germ, green leafy vegetables, nuts, legumes (Animal foods are poor sources.) | Anemia in premature infants; problems of nervous system |
| Vitamin K (mcg)<br>Phylloquinone ($K_1$)<br>Menaquinone ($MK_n$)<br>Menadione | 120 AI | 90 AI | • Bile is necessary for absorption of the vitamin<br>• Necessary for formation of prothrombin<br>• Sulfa drugs and antibiotics interfere with absorption<br>• Large amounts are toxic | Green leaves (alfalfa, spinach, cabbage), liver, egg yolk, butterfat (is synthesized in intestine by beneficial bacteria) | Prolonged clotting time, hemorrhagic* disease in newborn infants |
| **Minerals** | | | | | |
| Calcium (mg) | 1,000-1,200 AI | 1,000-1,200 AI | • Needed to build bones and teeth; helps clot blood<br>• Helps muscles contract and relax normally. Delays fatigue | Milk, cheese, ice cream, greens (kale, broccoli, collards, turnips, mustard), dried peas and beans | Retarded bone mineralization, fragile bones, rickets,* osteomalacia*, osteoporosis* |
| Chromium (mcg)[5] | 35 AI | 25 AI | • Works along with insulin in carbohydrate, protein and fat metabolism; glucose tolerance factor (GTF)* | Brewer's yeast, liver, meat, cheese, whole-grain cereals | Inability of cells to use glucose for energy |
| Copper (mcg) | 900 | 900 | • Aids absorption and use of iron in synthesis of hemoglobin in blood cells | Liver, shellfish, meats, nuts, legumes, whole-grain cereals | Anemia |
| Flouride (mg) | 4.0 AI | 3.0 AI | • Makes teeth resistant to decay Most effective in young children<br>• Moderate levels in bone may reduce osteoporosis* | Water (1 part per million is added to some municipal water supplies) | None known |

**(Continued on back)**

[1] M = Males (19 to 50).
[2] F = Females (19 to 50).
[3] 1 NE (niacin equivalent) is equal to 1 mg of niacin or 60 mg of dietary tryptophan
[4] RAE = Retinol activity equivalents. 1 retinal equivalent = 1 mcg retinol or 6 mcg beta-carotene
[5] $\alpha$ tocopherol
[6] Estimated sodium and potassium minimum requirements

* See Glossary for definitions
**Average minimum amounts of glucose used by brain
***Supplement during pregnancy of 400 mcg folic acid plus folate intake of a varied diet

| Minerals | RDA* M[1] | RDA* F[2] | Functions in the Body | Sources | Deficiency |
|---|---|---|---|---|---|
| Iron (mg) | 8 | 18 | • Constituent of hemoglobin and myoglobin.<br>• Enzyme involved in energy metabolism | Liver, organ meats, meat, poultry, egg yolk, enriched and whole-grain breads, cereals, dark green vegetables, legumes, dark molasses, peaches, apricots, prunes, raisins | Anemia (frequent in infants, preschool children, teenage girls, pregnant women) |
| Magnesium (mg) | 400-420 | 310-320 | • Activates enzymes involved in protein synthesis.<br>• Helps muscles and nerves work. | Whole-grain cereals, nuts, legumes, meat, milk, green leafy vegetables | Tremors, growth failure |
| Manganese (mg)[5] | 2.3 AI | 1.8 AI | • Activates many enzymes used in carbohydrate and protein metabolism.<br>• Helps build bones. | Legumes, nuts, whole-grain cereals | None known |
| Phosphorus (mg)[5] | 700 | 700 | • Builds strong bones and teeth.<br>• Releases energy from fat, protein and carbohydrates during metabolism.<br>• Aids in formation of genetic material, cell membranes, and enzymes. | Breads, cereals, lima beans, meat, poultry, fish, milk, cheese and yogurt | Bone loss, weakness, anorexia, malaise and pain (Found in many foods, so deficiency is rare.) |
| Selenium (mcg) | 55 | 55 | • Antioxidant.*<br>• Lessen breakdown of vitamin E. | Meat and seafoods, cereal foods | None known |
| Zinc (mg) | 11 | 8 | • A constituent of the enzymes carbonic anhydrase, carboxypeptidase, and lactic dehydrogenase. | Seafoods, liver and other organ meats, meats, fish, wheat, yeast (Plant foods are generally low in zinc.) | Poor wound healing, decreased ability to taste |
| **Electrolytes** | | | | | |
| Sodium (mg)[6] (minimum) | 500[6]<br>2400 | 500[6]<br>2400 | • Found in extracellular fluid (blood).<br>• Maintains water balance and nerve transmission. | Table salt, cheddar cheese, ham, snack foods | Lethargy caused by profuse sweating, vomiting or diarrhea |
| Potassium (mg)[6] (minimum) | 2000[6]<br>3500 | 2000[6]<br>3500 | • Found inside the cell.<br>• Maintains fluid balance, nerve transmission. | Bananas, orange juice, most fruits, potatoes, peanuts | Weakness, poor muscle tone, heart abnormalities, apathy |
| Water | 1.0-1.5 ml/kcal of energy expended | | • Transports nutrients.<br>• Transports waste products.<br>• Lubricates joints.<br>• Regulates body temperature. | Juices, beverages, water, solid foods | Dehydration, constipation |

Produced by Agricultural Communications, The Texas A&M University System

Extenson publicatons can be found on the Web at *http://tcebookstore.org*

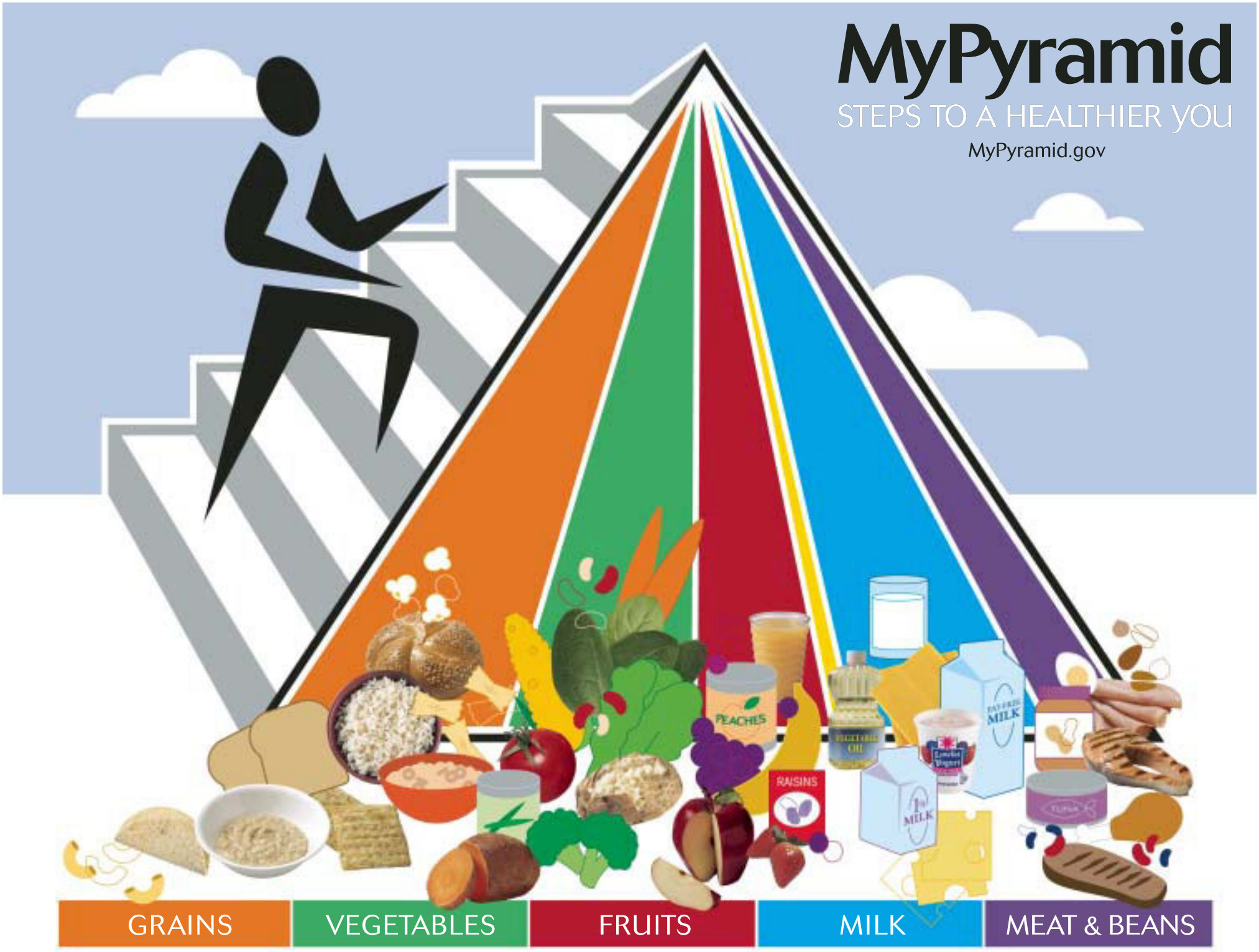


Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Chester P. Fehlis, Deputy Director, Texas Cooperative Extension, The Texas A&M University System.
Revised

# MyPyramid

STEPS TO A HEALTHIER YOU

MyPyramid.gov



## GRAINS
Make half your grains whole

Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day

1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or 1/2 cup of cooked rice, cereal, or pasta

Eat 6 oz. every day

## VEGETABLES
Vary your veggies

Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens

Eat more orange vegetables like carrots and sweetpotatoes

Eat more dry beans and peas like pinto beans, kidney beans, and lentils

Eat 2 1/2 cups every day

## FRUITS
Focus on fruits

Eat a variety of fruit

Choose fresh, frozen, canned, or dried fruit

Go easy on fruit juices

Eat 2 cups every day

## MILK
Get your calcium-rich foods

Go low-fat or fat-free when you choose milk, yogurt, and other milk products

If you don't or can't consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages

Get 3 cups every day; for kids aged 2 to 8, it's 2

## MEAT & BEANS
Go lean with protein

Choose low-fat or lean meats and poultry

Bake it, broil it, or grill it

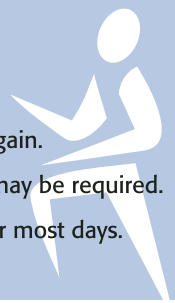
Vary your protein routine — choose more fish, beans, peas, nuts, and seeds

Eat 5 1/2 oz. every day

**For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.**

### Find your balance between food and physical activity

- Be sure to stay within your daily calorie needs.
- Be physically active for at least 30 minutes most days of the week.
- About 60 minutes a day of physical activity may be needed to prevent weight gain.
- For sustaining weight loss, at least 60 to 90 minutes a day of physical activity may be required.
- Children and teenagers should be physically active for 60 minutes every day, or most days.



### Know the limits on fats, sugars, and salt (sodium)

- Make most of your fat sources from fish, nuts, and vegetable oils.
- Limit solid fats like butter, margarine, shortening, and lard, as well as foods that contain these.
- Check the Nutrition Facts label to keep saturated fats, *trans* fats, and sodium low.
- Choose food and beverages low in added sugars. Added sugars contribute calories with few, if any, nutrients.

MyPyramid.gov
STEPS TO A HEALTHIER YOU

U.S. Department of Agriculture
Center for Nutrition Policy and Promotion
April 2005
CNPP-15

USDA