



Ingredient Substitutions

Julie Garden-Robinson, Ph.D., R.D., L.R.D.
Food and Nutrition Specialist

INGREDIENT SUBSTITUTIONS

Have you ever been all set to prepare a food and suddenly discovered you were missing a certain ingredient? Sometimes it is inconvenient to go to the store to purchase the necessary ingredient. It may be more convenient to try a substitute from supplies available in your kitchen.

The following chart gives substitutes that may be used to achieve a product that is similar to the original. There are, however, a number of factors to consider when substituting ingredients. Each ingredient in a recipe has a specific function. Substitution of one ingredient for another may alter the taste, color, moisture content or texture of the product. For this reason, it is suggested that ingredient substitution be used in unexpected situations only.

If you don't have the food listed in the "ingredient" column, try one of the alternatives listed in the "substitutes" column.

PURDUE | **LOCAL FACES**
EXTENSION | **COUNTLESS CONNECTIONS**
1-888-EXT-INFO • www.extension.purdue.edu

NDSU EXTENSION
SERVICE

INGREDIENT	AMOUNT	SUBSTITUTES
Allspice	1 teaspoon	• ½ teaspoon cinnamon and ½ teaspoon ground cloves
Apple pie spice	1 teaspoon	• ½ teaspoon cinnamon, ¼ teaspoon nutmeg and 1/8 teaspoon cardamom
Arrowroot starch	1 teaspoon	• 1 tablespoon flour • 1½ teaspoon cornstarch
Baking powder	1 teaspoon	• ¼ teaspoon baking soda plus 5/8 teaspoon cream of tartar • ¼ teaspoon baking soda plus ½ cup sour milk or buttermilk or yogurt (decrease liquid called for in recipe by ½ cup) • ¼ teaspoon baking soda plus ½ tablespoon vinegar or lemon juice used with sweet milk to make ½ cup (decrease liquid called for in recipe by ½ cup) • ¼ teaspoon baking soda plus ¼ to ½ cup molasses (decrease liquid in recipe by 1 to 2 tablespoons) • 1/3 teaspoon baking soda plus ½ teaspoon cream of tartar
Bay leaf	1 whole	• ¼ teaspoon cracked bay leaves
Beau monde seasoning	1 teaspoon	• 1 teaspoon seasoning salt • ½ teaspoon table salt plus dash of garlic, onion and celery salts or powders
Beef stock base, instant	2 teaspoons	• 1 beef bouillon cube
Beef stock base, instant	4 teaspoons dissolved in 1¼ cups water	• 1 can (10½ ounces) condensed, undiluted beef bouillon or consommé
Bread crumbs, dry	1/3 cup	• 1 slice of bread
Bread crumbs, soft	3/4 cup	• 1 slice bread
Broth, beef or chicken	1 cup	• 1 bouillon cube dissolved in 1 cup boiling water • 1 teaspoon powdered broth base dissolved in 1 cup boiling water
Butter	1 cup	• 7/8 to 1 cup hydrogenated fat plus ½ teaspoon salt • 7/8 cup oil plus ½ teaspoon salt • 7/8 cup lard plus ½ teaspoon salt • 1 cup margarine • 7/8 cup oil
Carob powder	If recipe calls for 3 tablespoons carob powder plus 2 tablespoons water	• 1 ounce unsweetened chocolate

INGREDIENT	AMOUNT	SUBSTITUTES
Catsup	1 cup	1 cup tomato sauce, ½ cup sugar and 2 tablespoons vinegar (for use in cooking)
Chicken stock base, instant	1½ teaspoons	1 chicken bouillon cube
Chicken stock base, instant	1 tablespoon dissolved in 1 cup water	1 cup canned or homemade chicken broth or stock
Chili sauce	1 cup	1 cup tomato sauce, ¼ cup brown sugar, 2 tablespoons vinegar, ¼ teaspoon cinnamon, dash of ground cloves and dash of allspice
Chives, finely chopped	2 teaspoons	2 teaspoons finely chopped green onion tops
Chocolate chips, semisweet	1 ounce	1 ounce sweet cooking chocolate
Chocolate, semisweet	1-2/3 ounces	1 ounce unsweetened chocolate plus 4 teaspoons sugar
Chocolate, semisweet pieces, melted	6 ounce package	2 squares unsweetened chocolate plus 2 tablespoons shortening and ½ cup sugar
Chocolate, unsweetened	1 ounce or square	3 tablespoons cocoa plus 1 tablespoon butter or margarine 3 tablespoons carob powder plus 2 tablespoons water
Cocoa	¼ cup or 4 tablespoons	1 ounce (square) chocolate (decrease fat called for in recipe by ½ tablespoon)
Coconut	1 tablespoon grated, dry	1½ tablespoons fresh, grated
Coconut Cream	1 cup	1 cup cream
Coconut Milk	1 cup	1 cup milk
Corn Syrup	1 cup	1 cup sugar plus ¼ cup liquid (use whatever liquid is called for in the recipe) 1 cup honey
Cornstarch (for thickening)	1 tablespoon	2 tablespoons all-purpose flour 4 to 6 teaspoons quick-cooking tapioca
Cracker crumbs	¾ cup	1 cup bread crumbs
Cream cheese		Part skim milk ricotta cheese or lowfat cottage cheese beaten until smooth
Cream, half-and-half	1 cup	7/8 cup whole milk plus ½ tablespoon butter or margarine 3 tablespoons oil plus milk to equal 1 cup 1 cup evaporated milk
Cream, heavy (36 to 40% fat)	1 cup	¾ cup milk plus 1/3 cup butter or margarine (for use in cooking and baking) 2/3 cup buttermilk plus 1/3 cup oil - Evaporated skim milk or equal parts of part-skim milk ricotta cheese and nonfat yogurt beaten until smooth (this mixture cannot be heated because of separation)

INGREDIENT	AMOUNT	SUBSTITUTES
Cream, light (18 to 20% fat)	1 cup	• 1 cup undiluted evaporated milk • 14 tablespoons milk plus 3 tablespoons butter or margarine
Cream, sour (See <i>Sour cream, cultured</i>)	1 cup	• 3 tablespoons butter plus 7/8 cup sour milk • 7/8 cup buttermilk plus 3 tablespoons butter
Cream, whipped		• Chill a 13 oz. can of evaporated milk for 12 hours. Add 1 teaspoon lemon juice. Whip until stiff. • Beat until stiff: ½ cup ice-cold water and ½ cup nonfat dry milk. Add ½ cup sugar, slowly, while beating. Then add 2 tablespoons lemon juice and beat until mixed well.
Cream, whipping	1 cup	• 2 tablespoons lemon juice, 2 tablespoons sugar, 1 cup evaporated milk • ¾ cup milk plus 1/3 cup butter (for cooking only)
Cream of tartar	½ teaspoon	• 1½ teaspoon lemon juice or vinegar
Dill plant, fresh or dried	3 heads	• 1 tablespoon dill seed
Egg	1 whole (3 tablespoons)	• 3 tablespoons slightly beaten egg • 3 tablespoons plus 1 teaspoon frozen egg, thawed • 2½ tablespoons sifted dry whole egg powder plus 2½ tablespoons lukewarm water • ¼ cup egg substitute • 1 egg white and 2 teaspoons oil • 2 egg whites • 2 yolks plus 1 tablespoon water (in cookies) • 2 yolks (in custards, cream fillings and similar mixtures)
Egg substitute	1 egg	• 2 egg whites. May add 1 to 3 teaspoons vegetable oil for each yolk omitted. • 1 egg white, 2¼ teaspoons nonfat dry milk powder, and 2 teaspoons vegetable oil (may store 1 week in refrigerator or freezer) • In cookies and cakes only — use 2 tablespoons water plus ½ teaspoon baking powder • In cookie and cake recipes that call for 2 or 3 eggs — for each egg, use 2 tablespoons flour, ½ tablespoon shortening, ½ teaspoon baking powder, 2 tablespoons liquid (use liquid called for in recipe)

INGREDIENT	AMOUNT	SUBSTITUTES
Egg white	1 white (2 tablespoons)	• 2 tablespoons frozen egg white, thawed • 2 teaspoons sifted dry egg white powder plus 2 tablespoons lukewarm water
Egg yolk	1 yolk (1½ tablespoons)	• 2 tablespoons sifted dry egg yolk powder plus 2 teaspoons water • 1-1/3 tablespoons frozen egg yolk, thawed
Extracts (example: mint extract)	1 teaspoon ¼ teaspoon	• ¼ teaspoon oil of similar flavor • 2 drops oil of similar flavor (oils won't evaporate at high temperatures)
Flavor-based oil (example: oil of peppermint)	¼ teaspoon 2 drops	• 1 teaspoon extract of same flavor • ¼ teaspoon extract of same flavor
Flour, all-purpose (for thickening)	1 tablespoon	• ½ tablespoon cornstarch, potato starch, rice starch or arrowroot starch • 1 tablespoon granular tapioca • 2 to 3 teaspoons quick-cooking tapioca • 1 tablespoon waxy rice flour • 1 tablespoon waxy corn flour • 2 tablespoons browned flour • 1½ tablespoons whole wheat flour • ½ tablespoon whole wheat flour plus ½ tablespoon all-purpose flour
Flour, all-purpose (Note: Speciality flours added to yeast bread recipes will result in a reduced volume and a heavier product)	1 cup sifted	The following flours require more leavening than wheat flour, so add 2½ teaspoons baking powder per cup of flour. An even lighter product results when buttermilk plus ½ teaspoon baking soda is substituted for each cup of milk in the recipe: • 1¼ cups rye flour • ¾ cup rice flour • 1½ cups oat flour • 1 cup corn flour • ¾ cup coarse cornmeal • 1 cup fine cornmeal • 5/8 cup potato starch flour • 1-1/8 cups cake flour • 1½ cups bread crumbs • 1 cup rolled oats • 1½ cups barley flour • 1 cup unsifted all-purpose flour minus 2 tablespoons

INGREDIENT	AMOUNT	SUBSTITUTES
Flour, all-purpose — <i>continued</i>	1 cup sifted	• 1/3 cup cornmeal or soybean flour plus 2/3 cup all-purpose flour • 1/2 cup cornmeal, bran, rice flour, rye flour or whole wheat flour plus 1/2 cup all-purpose flour • Substitute whole wheat flour for 1/4 to 1/2 of white flour called for in a recipe • 1/4 cup soybean flour plus 3/4 cup all-purpose flour • 1/3 cup wheat germ plus 2/3 cup all-purpose flour
Flour, cake	1 cup sifted	• 1 cup minus 2 tablespoons sifted all-purpose flour
Flour, pastry	1 cup	• 7/8 cup all-purpose flour
Flour, self-rising	1 cup	• 1 cup minus 2 teaspoons all-purpose flour plus 1 1/2 teaspoons baking powder and 1/2 teaspoon salt
Flour, whole wheat	1 cup	• 1 cup white wheat flour • 1 cup graham flour
Garlic	1 clove, small	• 1/8 teaspoon garlic powder or 1/4 teaspoon instant minced garlic
Garlic salt	3/4 teaspoon	• 1 medium size clove or 1/2 teaspoon minced fresh
Gelatine, flavored	3-ounce package	• 1 tablespoon plain gelatine plus 2 cups fruit juice
Ginger	1/8 teaspoon, powdered	• 1 tablespoon candied ginger rinsed in water to remove sugar, finely cut • 1 tablespoon fresh ginger, grated
Herbs, dried	1 teaspoon	• 1 tablespoon fresh, finely cut
Herbs, fresh	1 tablespoon, finely cut	• 1 teaspoon dried herbs • 1/2 teaspoon ground herbs
Honey	1 cup	• 1 1/4 cups sugar plus 1/4 cup liquid (use liquid called for in recipe)
Horseradish	1 tablespoon, fresh	• 2 tablespoons bottled
Lemon	1 teaspoon juice 1 medium	• 1/2 teaspoon vinegar • 2 to 3 tablespoons lemon juice and 1 to 2 teaspoons rind
Lemon peel, dried	1 teaspoon	• 1 to 2 teaspoons grated fresh lemon peel • grated peel of 1 medium size lemon • 1/2 teaspoon lemon extract
Macaroni (4 cups cooked)	2 cups, uncooked	• 2 cups spaghetti, uncooked, (2 inch pieces) • 4 cups noodles, uncooked

INGREDIENT	AMOUNT	SUBSTITUTES
Maple sugar	½ cup	• 1 cup maple syrup
Maple sugar (grated and packed)	1 tablespoon	• 1 tablespoon white granulated sugar
Marshmallows, miniature	1 cup	• 10 large
Mayonnaise (for use in salads and salad dressings)	1 cup	• ½ cup yogurt and ½ cup mayonnaise or salad dressing • 1 cup salad dressing • 1 cup sour cream • 1 cup yogurt • 1 cup cottage cheese pureed in a blender
Milk, buttermilk	1 cup	• 1 cup plain yogurt
Milk, buttermilk or sour	1 cup	• 1 cup minus 1 tablespoon sweet milk plus 1 tablespoon lemon juice or vinegar (allow to stand 5 to 10 minutes) • 1 cup sweet milk and 1¾ teaspoons cream of tartar
Milk, evaporated (whole or skim)	If recipe calls for ½ cup plus ½ cup water	• 1 cup liquid whole milk
Milk, evaporated	1 can (about 12 ounces)	• Whip until smooth: 1 cup nonfat dry milk 1¾ cups warm water Keep refrigerated
Milk, skim	1 cup	• 4 to 5 tablespoons nonfat dry milk powder and enough water to make one cup, or follow manufacturer's directions
	¼ cup	• 4 teaspoons nonfat dry milk powder plus water to make ¼ cup, or follow manufacturer's directions
	1/3 cup	• 2 tablespoons nonfat dry milk powder plus water to make 1/3 cup, or follow manufacturer's directions
Milk, sweetened condensed	1 can (about 1-1/3 cup)	• Heat the following ingredients until sugar and butter are dissolved: 1/3 cup and 2 tablespoons evaporated milk 1 cup sugar 3 tablespoons butter or margarine
	1 cup	• Heat the following ingredients until sugar and butter are dissolved: 1/3 cup evaporated milk ¾ cup sugar 2 tablespoons butter or margarine • Add 1 cup plus 2 tablespoons dry milk powder to ½ cup warm water. Mix well. Add ¾ cup sugar and stir until smooth.

INGREDIENT	AMOUNT	SUBSTITUTES
Milk, sweetened condensed	To make about 1¼ cups in blender	• Combine 1 cup instant nonfat dry milk, 2/3 cup sugar, 1/3 cup boiling water and 3 tablespoons margarine. Blend until smooth. To thicken, let set in refrigerator for 24 hours.
Milk, whole	1 cup	• 1 cup reconstituted nonfat dry milk plus 2½ teaspoons butter or margarine • ½ cup evaporated milk plus ½ cup water • 1 cup buttermilk plus ½ teaspoon baking soda (for use in baking, decrease baking powder by 2 teaspoons) • 4 tablespoons whole dry milk plus 1 cup water or follow manufacturer's directions • 1 cup fruit juice or 1 cup potato water (in baking) • ¼ cup nonfat dry milk, 7/8 cup water and 2 teaspoons butter or margarine • 1 cup water plus 1½ teaspoons butter (in baking)
Molasses	1 cup	• ¾ cup sugar plus 2 teaspoons baking powder (increase liquid called for in recipe by 5 tablespoons and decrease baking soda by ½ teaspoon) • ¾ cup sugar plus 1¼ teaspoons cream of tartar (increase liquid called for in recipe by 5 tablespoons)
Mushrooms	1 pound fresh	• 3 ounces dried mushrooms • 6- or 8-ounce can
Mushrooms, powdered	1 tablespoon	• 3 tablespoons whole dried mushrooms • 4 ounces fresh • 2 ounces canned
Mustard, dry	1 teaspoon	• 1 tablespoon prepared mustard • ½ teaspoon mustard seeds
Oil, flavor-based (example: oil of peppermint)		• See Flavor-Based Oil
Onion	1 small	• ¼ cup chopped, fresh onion • 1-1/3 teaspoons onion salt • 1 to 2 tablespoons minced onion • 1 teaspoon onion powder

INGREDIENT	AMOUNT	SUBSTITUTES
Orange	1 medium	• 6 to 8 tablespoons juice
Orange peel, dried	1 tablespoon	• 2 to 3 tablespoons grated fresh orange peel • Grated peel of 1 medium-size orange
	2 teaspoons	• 1 teaspoon orange extract
Orange peel, fresh	1 medium	• 2 to 3 tablespoons grated fresh orange peel
Parsley, dried	1 teaspoon	• 3 teaspoons fresh parsley, chopped
Peppers, green bell	1 tablespoon, dried	• 3 tablespoons fresh green pepper, chopped
Peppers, red bell	1 tablespoon, dried	• 3 tablespoons fresh red bell pepper, chopped • 2 tablespoons pimiento, chopped
Peppermint extract	1 tablespoon	• ¼ cup fresh mint, chopped • See also Extracts
Pimiento	2 tablespoons chopped	• 1 tablespoon dried red bell peppers, rehydrated • 3 tablespoons fresh red bell pepper, chopped
Pumpkin pie spice	1 teaspoon	• ½ teaspoon cinnamon, ¼ teaspoon ginger, 1/8 teaspoon allspice and 1/8 teaspoon nutmeg
Rennet	1 tablet	• 1 tablespoon liquid rennet
Rice	1 cup regular, uncooked (3 cups cooked)	• 1 cup uncooked converted rice • 1 cup uncooked brown rice • 1 cup uncooked wild rice
	1 cup cooked	• 1 cup cooked bulgur wheat • 1 cup cooked pearl barley
Rum	¼ cup	• 1 tablespoon rum extract plus 3 tablespoons liquid (use liquid called for in recipe or water)
Shortening, melted	1 cup	• 1 cup cooking oil (cooking oil should not be substituted if recipe does not call for melted shortening)
Shortening, solid (used in baking)	1 cup	• 1 cup minus 2 tablespoons lard • 1-1/8 cups butter or margarine (decrease salt called for in recipe by ½ teaspoon)
Shrimp, fresh	1 cup cleaned, cooked	• ¾ pound raw in shell, clean and cook • 7-ounce package frozen, peeled shrimp, cooked • 4½- or 5-ounce can of shrimp

INGREDIENT	AMOUNT	SUBSTITUTES
Sour cream, cultured	1 cup	• 7/8 cup sour milk or buttermilk plus 1/3 cup butter or margarine • Blend until smooth: 1/3 cup buttermilk, 1 tablespoon lemon juice and 1 cup cottage cheese • 1-1/8 cups non-fat dry milk powder, 1/2 cup warm water, and 1 tablespoon vinegar (mixture will thicken in refrigerator in a few hours) • 1 cup evaporated milk at 70°F plus 1 tablespoon vinegar (allow to stand until it clabbers) • 1 cup plain yogurt (in cooking add a tablespoon of cornstarch to each cup to prevent separating) • 3/4 cup milk, 3/4 teaspoon lemon juice and 1/3 cup butter or margarine • 3/4 cup buttermilk plus 1/4 cup oil • 1 cup cottage cheese and 2 or 3 teaspoons of lemon juice, pureed in blender
Spearmint, extract	1 tablespoon	• 1/4 cup fresh mint, chopped • See also Extracts
Sugar, brown	1 cup, firmly packed	• 1 cup granular sugar • 1 cup granulated sugar plus 1/4 cup molasses
Sugar, confectioners' or powdered	1 cup	• 3/4 cup granulated sugar
Sugar, white	1 teaspoon 1 cup	• 1/2 to 3/4 teaspoon honey or molasses • 2 cups corn syrup (reduce liquid called for in recipe by 1/4 cup. Never replace more than 1/2 of sugar called for in recipe with corn syrup.) • 1 cup brown sugar, firmly packed • 1 3/4 cups confectioners' sugar (for uses other than baking) • 1 cup molasses plus 1/2 teaspoon soda (omit baking powder or use very little. Substitute molasses for no more than half the sugar. Reduce liquid in recipe by 1/4 cup per cup of molasses.) • 3/4 cup maple syrup (Reduce liquid called for in recipe by 3 tablespoons.) • 1 cup honey (decrease liquid called for in recipe by 1/4 cup. In baked goods, add 1/2 teaspoon of baking soda for each cup of honey substituted and lower baking temperature 25 degrees. In cookie recipes using eggs and no additional liquid, increase the flour by

INGREDIENT	AMOUNT	SUBSTITUTES
Sugar, white — <i>continued</i>		about 2 tablespoons per cup of honey. Chill before shaping and baking. Half of the sugar in cakes, cookies and brownies can be replaced with honey. Two-thirds of the sugar can be replaced in fruit bars, but replace no more than a third of the sugar in ginger snaps with honey. When making cakes or cookies, first mix honey with the fat or the liquid, then mix with other ingredients. If this is not done, a soggy layer may form on top of the baked product.)
Sugar, white		Sweeteners: • Sugar Twin and Sprinkle Sweet: measure like sugar. Substitute 1 teaspoon sweetener for 1 teaspoon sugar, 1 cup sweetener for 1 cup sugar. • Equal: 1 packet = 2 teaspoons sugar • Sweet 10: 10 drops = 1 teaspoon sugar 1 tablespoon = ½ cup sugar
Tapioca, granular	1 tablespoon 2 teaspoons	• 2 tablespoons pearl tapioca • 1 tablespoon flour
Tomato juice	1 cup	• ½ cup tomato sauce plus ½ cup water
Tomatoes, fresh	2 cups, chopped	• 16-ounce can
Tomato sauce	15-ounce can	• 6-ounce can tomato paste plus 1 cup water
Tomatoes, chopped	16-ounce can	• 3 fresh medium tomatoes • 16-ounce can stewed tomatoes
Tomato soup	10¾-ounce can	• 1 cup tomato sauce plus ¼ cup water
Vanilla extract	1 teaspoon	• 1-inch vanilla bean split and simmered in liquid of recipe
Wine	1 cup	• 13 tablespoons water, 3 tablespoons lemon juice and 1 tablespoon sugar
Worcestershire sauce	1 teaspoon	• 1 teaspoon bottled steak sauce
Yeast, active dry	1 tablespoon	• 1 cake (6/10 ounce), compressed (2/3 ounce)
Yogurt, plain	1 cup	• 1 packaged (¼ ounce) active dry yeast • 1 cup buttermilk • 1 cup cottage cheese blended until smooth • 1 cup sour cream

*The information given herein is for educational purposes only.
The NDSU Extension Service does not endorse commercial products or companies
even though reference may be made to brand names, trademarks or service names.*

MEASURING UP

These commonly used equivalent measures will simplify your recipe preparation.

- **GENERAL**

- 3 teaspoons = 1 tablespoon
- 4 tablespoons = 1/4 cup
- 5 tablespoons + 1 teaspoon = 1/3 cup
- 16 tablespoons = 1 cup
- 2 cups = 1 pint
- 2 pints = 1 quart

- **BUTTER**

- 1/2 ounce (1/8 stick) = 1 tablespoon
- 1 ounce (1/4 stick) = 2 tablespoons
- 2 ounces (1/2 stick) = 4 tablespoons
- 4 ounces (1 stick) = 1/2 cup
- 16 ounces (4 sticks) = 2 cups

- **CHOCOLATE**

- 12-ounce morsels = 1 cup melted chocolate
- 12-ounce morsels = 2 cups whole morsels

- **CREAM**

- 1 cup heavy cream = 2 cups whipped cream

- **EGGS**

- 8-10 whites, large = 1 cup egg whites
- 12-14 yolks, large = 1 cup egg yolks

- **FLOUR**

- 1 pound = 4 cups

- **FRUIT**

- 1 medium lemon = 3 tablespoons juice + 1 tablespoon grated rind
- 1 medium orange = 1/3 to 1/2 cup juice + 2 tablespoons grated rind
- 1 pound apples = 3 medium whole or 3 cups sliced
- 1 pound bananas = 3 medium whole or 1 1/2 cups mashed

- **NUTMEATS**

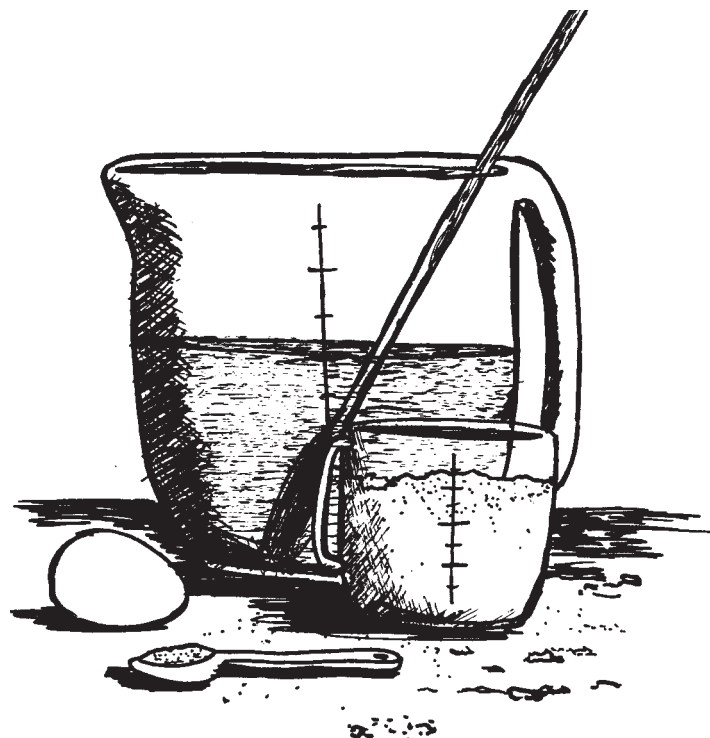
- 4 1/2 ounces nuts, chopped = 1 cup

- **POPCORN**

- 1/4 cup kernels = 8 cups popped

- **SUGAR**

- 1 pound brown sugar = 2 1/4 cups
- 1 pound confectioners' = 4 1/2 cups sifted



Original Authors
Nancy Brockel Kaufman
Food and Nutrition Specialist

Pat Beck
Nutrition Specialist

PURDUE | **LOCAL FACES**
EXTENSION | **COUNTLESS CONNECTIONS**

1-888-EXT-INFO • www.extension.purdue.edu

For more information on this and other topics, see www.ag.ndsu.edu

NDSU encourages you to use and share this content, but please do so under the conditions of our Creative Commons license. You may copy, distribute, transmit and adapt this work as long as you give full attribution, don't use the work for commercial purposes and share your resulting work similarly. For more information, visit www.ag.ndsu.edu/agcomm/creative-commons.

North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, sex, sexual orientation, status as a U.S. veteran, race or religion. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701) 231-7708.

County Commissions, NDSU and U.S. Department of Agriculture Cooperating.
This publication will be made available in alternative formats for people with disabilities upon request, (701) 231-7881.