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## Ingredient Substitution

Georgia C. Lauritzen Ph. D.  
*Utah State University*

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# INGREDIENT SUBSTITUTION

*Georgia C. Lauritzen, PhD, Food and Nutrition Specialist*

At times it is necessary to use a substitution for a recipe ingredient. The substituted food may not perform exactly as the original food. Each ingredient has specific functions in a recipe, and a substitute may alter the flavor, color, texture, or volume, but may still result in an acceptable finished product.

Ingredient	Amount	Substitute or Equivalent
<b>LEAVENING AGENTS</b>		
Baking Powder	1 teaspoon	¼ teaspoon baking soda plus ⅝ teaspoon cream of tartar, or ¼ teaspoon soda plus ½ cup fully soured milk or buttermilk, or ¼ teaspoon baking soda plus ½ tablespoon vinegar or lemon juice used with sweet milk to make ½ cup, or ¼ teaspoon baking soda plus ¼ to ½ cup molasses
Yeast, active dry	1 tablespoon	1 package active dry yeast, or 1 compressed yeast cake
<b>LIQUID</b>		
Whole egg, raw	1 large = 3 T. 1 c. = 5 large 1 c. = 6 medium	2 egg yolks, or 3 tablespoons plus 1 teaspoon thawed frozen egg, or 2 tablespoons and 2 teaspoons dry whole egg powder plus an equal amount of water
Egg yolk, raw	1 = 1½ T. 1 cup = 12 large	3½ teaspoons thawed frozen egg yolk, or 2 tablespoons dry egg yolk plus 2 teaspoons water
Egg white, raw	1 = 2 T. 1 c. = 8 large	2 tablespoons thawed frozen egg white, or 2 teaspoons dry egg white plus 2 tablespoons water
Cream, half & half (12-16% fat)	1 cup	⅞ cup milk plus 1½ tablespoons butter or margarine (for use in cooking), or 1 cup evaporated milk, undiluted
Cream, light (18-20% fat)	1 cup	⅞ cup milk and 3 tablespoons butter or margarine (for use in cooking and baking), or 1 cup evaporated milk, undiluted
Cream, heavy (36-40% fat)	1 cup (2-2½ cups whipped)	¾ cup milk and ⅓ cup butter or margarine (for use in cooking and baking)
Milk, whole	1 cup	1 cup reconstituted nonfat dry milk plus 2½ teaspoons butter or margarine, or ½ cup evaporated milk plus ½ cup water, or ¼ cup sifted dry whole milk powder plus ⅞ cup water

Ingredient	Amount	Substitute or Equivalent
Milk	1 cup	$\frac{1}{3}$ cup instant nonfat dry milk plus 1 cup minus 1 tablespoon water, or 3 tablespoons sifted regular nonfat dry milk plus 1 cup minus 1 tablespoon water
Milk, sweetened, condensed	1 can = $1\frac{1}{3}$ cup	1 cup plus 2 tablespoons dry milk plus $\frac{1}{2}$ cup warm water; mix well, add $\frac{3}{4}$ cup sugar and 3 tablespoons melted butter or margarine, stir until smooth; or $\frac{1}{3}$ cup plus 2 tablespoons evaporated milk, 1 cup sugar, and 3 tablespoons melted butter or margarine. Heat and stir until sugar and butter dissolve.
Buttermilk or Sour milk	1 cup	1 tablespoon vinegar or lemon juice plus enough sweet milk to make 1 cup (let stand 5 minutes) or $1\frac{3}{4}$ teaspoons cream of tartar plus 1 cup sweet milk, or 1 cup plain yogurt
Sour Cream	1 cup	1 cup plain yogurt, or $\frac{7}{8}$ cup sour milk plus $\frac{1}{8}$ cup butter
<b>SUGAR</b>		
Granulated sugar	1 cup	1 cup corn syrup (decrease liquid called for in recipe by $\frac{1}{4}$ cup), or 1 cup molasses (decrease liquid called for in recipe by $\frac{1}{4}$ cup), or 1 cup brown sugar, firmly packed, or $\frac{3}{4}$ cup honey (decrease liquid called for in recipe by $\frac{1}{4}$ cup; for each cup of honey in baked goods, add $\frac{1}{2}$ teaspoon soda) <i>Equivalent: 1 pound granulated sugar = <math>2\frac{1}{4}</math> cups</i>
Brown sugar	1 cup (firmly packed)	1 cup granulated sugar <i>Equivalent: 1 pound brown sugar = <math>2\frac{1}{4}</math> cups firmly packed</i>
Light brown sugar	1 cup	$\frac{1}{2}$ cup dark brown sugar plus $\frac{1}{2}$ cup granulated sugar
Powdered sugar		<i>Equivalent: 1 pound powdered sugar = <math>3\frac{1}{2}</math>–4 cups</i>
Corn syrup	1 cup	1 cup sugar plus $\frac{1}{4}$ cup liquid
Dark corn syrup	1 cup	$\frac{3}{4}$ cup light corn syrup and $\frac{1}{4}$ cup light molasses
Honey	1 cup	$1\frac{1}{4}$ cups sugar plus $\frac{1}{4}$ cup liquid
<b>FLOUR</b>		
Flour used as thickener	1 tablespoon	$\frac{1}{2}$ tablespoon cornstarch, potato starch, rice starch or arrowroot starch, or 1 tablespoon quick-cooking tapioca
All-purpose flour	1 cup sifted	1 cup unsifted all-purpose flour minus 2 tablespoons, or 1 cup plus 2 tablespoons cake flour; <i>Equivalent: 1 pound = 4 cups sifted or <math>3\frac{1}{2}</math> cups unsifted</i>
Cake flour	1 cup sifted	1 cup minus 2 tablespoons sifted all-purpose flour ( $\frac{7}{8}$ cup); <i>Equivalent: 1 pound = <math>4\frac{3}{4}</math> cups</i>
Self-rising flour	1 cup sifted	1 cup sifted all-purpose flour plus $1\frac{1}{2}$ teaspoons baking powder and $\frac{1}{2}$ teaspoon salt
Whole wheat flour	1 cup	1 cup all-purpose flour; <i>Equivalent: 1 pound = <math>3\frac{3}{4}</math> cups</i>
Cornmeal, self-rising	1 cup	$\frac{2}{3}$ cup plain, $1\frac{1}{2}$ tablespoons baking powder and $\frac{1}{2}$ teaspoon salt; <i>Equivalent: 1 pound = 3 cups</i>

Ingredient	Amount	Substitute or Equivalent
Milk	1 cup	1/3 cup instant nonfat dry milk plus 1 cup minus 1 tablespoon water, <b>or</b> 3 tablespoons sifted regular nonfat dry milk plus 1 cup minus 1 tablespoon water
Milk, sweetened, condensed	1 can = 1 1/3 cup	1 cup plus 2 tablespoons dry milk plus 1/2 cup warm water; mix well, add 3/4 cup sugar and 3 tablespoons melted butter or margarine, stir until smooth; <b>or</b> 1/3 cup plus 2 tablespoons evaporated milk, 1 cup sugar, and 3 tablespoons melted butter or margarine. Heat and stir until sugar and butter dissolve.
Buttermilk or Sour milk	1 cup	1 tablespoon vinegar or lemon juice plus enough sweet milk to make 1 cup (let stand 5 minutes) or 1 3/4 teaspoons cream of tartar plus 1 cup sweet milk, or 1 cup plain yogurt
Sour Cream	1 cup	1 cup plain yogurt, <b>or</b> 7/8 cup sour milk plus 1/8 cup butter
<b>SUGAR</b>		
Granulated sugar	1 cup	1 cup corn syrup (decrease liquid called for in recipe by 1/4 cup), <b>or</b> 1 cup molasses (decrease liquid called for in recipe by 1/4 cup), <b>or</b> 1 cup brown sugar, firmly packed, <b>or</b> 3/4 cup honey (decrease liquid called for in recipe by 1/4 cup; for each cup of honey in baked goods, add 1/2 teaspoon soda) <i>Equivalent: 1 pound granulated sugar = 2 1/4 cups</i>
Brown sugar	1 cup (firmly packed)	1 cup granulated sugar <i>Equivalent: 1 pound brown sugar = 2 1/4 cups firmly packed</i>
Light brown sugar	1 cup	1/2 cup dark brown sugar plus 1/2 cup granulated sugar
Powdered sugar		<i>Equivalent: 1 pound powdered sugar = 3 1/2-4 cups</i>
Corn syrup	1 cup	1 cup sugar plus 1/4 cup liquid
Dark corn syrup	1 cup	3/4 cup light corn syrup and 1/4 cup light molasses
Honey	1 cup	1 1/4 cups sugar plus 1/4 cup liquid
<b>FLOUR</b>		
Flour used as thickener	1 tablespoon	1/2 tablespoon cornstarch, potato starch, rice starch or arrowroot starch, <b>or</b> 1 tablespoon quick-cooking tapioca
All-purpose flour	1 cup sifted	1 cup unsifted all-purpose flour minus 2 tablespoons, <b>or</b> 1 cup plus 2 tablespoons cake flour; <i>Equivalent: 1 pound = 4 cups sifted or 3 1/3 cups unsifted</i>
Cake flour	1 cup sifted	1 cup minus 2 tablespoons sifted all-purpose flour (7/8 cup); <i>Equivalent: 1 pound = 4 3/4 cups</i>
Self-rising flour	1 cup sifted	1 cup sifted all-purpose flour plus 1 1/2 teaspoons baking powder and 1/2 teaspoon salt
Whole wheat flour	1 cup	1 cup all-purpose flour; <i>Equivalent: 1 pound = 3 3/4 cups</i>
Cornmeal, self-rising	1 cup	7/8 cup plain, 1 1/2 tablespoons baking powder and 1/2 teaspoon salt; <i>Equivalent: 1 pound = 3 cups</i>

Ingredient	Amount	Substitute or Equivalent
<b>FAT</b>		
Shortening, solid (used in baking)	1 cup	7/8 cup lard, or 1 1/8 cups butter or margarine (decrease salt in recipe by 1/2)
Shortening, melted	1 cup	1 cup cooking oil
Cooking oil*	1 cup	1 cup melted shortening
Butter	1 cup	1 cup margarine, or 7/8 to 1 cup hydrogenated fat plus 1/2 teaspoon salt, or 7/8 cup lard plus 1/2 teaspoon salt, or 4/5 cup bacon fat, clarified, or 3/4 cup chicken fat, clarified, or 7/8 cup oil
*Do not substitute oil for solid fat in a baking recipe unless you have a baking recipe which specifically calls for oil or melted fat. Characteristics of the final product could be significantly different.		
<b>RICE &amp; PASTA</b>		
Rice	1 pound  1 cup uncooked (regular)	8 cups cooked, <b>or</b> 2 1/4 - 1 1/2 cups uncooked  1 cup uncooked converted rice, <b>or</b> 1 cup uncooked brown rice, <b>or</b> 1 cup uncooked wild rice <i>Equivalent: 1 cup uncooked = 3 1/2-4 cups cooked</i>
Rice, instant		<i>Equivalent: 1 cup uncooked = 1 cup cooked</i>
Macaroni, 1-inch pieces	1 pound	3-3/4 cups uncooked macaroni, or 16 ounces of any pasta <i>Equivalent: 1 pound = 9 cups cooked</i>
Macaroni, shell	1 pound	4-5 cups uncooked macaroni <i>Equivalent: 1 pound = 9 cups cooked</i>
Noodles, 1-inch pieces	1 pound	6-8 cups uncooked noodles <i>Equivalent: 1 pound = 8 cups cooked</i>
Spaghetti	1 pound	4-5 cups of 2-inch pieces <i>Equivalent: 1 pound = 9 cups cooked</i>
<b>SPICES</b>		
Allspice	1 teaspoon	1/2 teaspoon cinnamon and 1/2 teaspoon ground cloves
Apple pie spice	1 teaspoon	1/2 teaspoon cinnamon, 1/4 teaspoon nutmeg, 1/8 teaspoon cardamon
Pumpkin pie spice	1 teaspoon	1/2 teaspoon cinnamon, 1/4 teaspoon ginger, 1/8 teaspoon allspice, 1/8 teaspoon nutmeg
<b>MISCELLANEOUS</b>		
Chocolate	1 ounce	3 tablespoons cocoa plus 1 tablespoon fat
Semisweet chocolate	1 ounce	1/2 ounce baking chocolate plus 1 tablespoon sugar

Ingredient	Amount	Substitute or Equivalent
Cocoa	¼ cup or 4 tablespoons	1 ounce (square) unsweetened chocolate (decrease fat called for in recipe by ½ tablespoon)
Cornstarch (for thickening)	1 tablespoon	2 tablespoons all-purpose flour; or 2 tablespoons granular tapioca
Gelatin, flavored	3 ounces	1 tablespoon plain gelatin and 2 cups fruit juice
Lemon		<i>Equivalent: 1 medium = 1 to 3 tablespoons juice, 1 to 2 teaspoons grated peel</i>
Lemon juice	1 teaspoon	½ teaspoon vinegar

### Equivalent Measures

This Much	Equals This Much	This Much	Equals This Much
1 gallon	4 quarts	¾ cup	6 tablespoons
1 quart	2 pints	⅓ cup	5⅓ tablespoons
1 pint	2 cups	¼ cup	4 tablespoons
1 bushel	4 pecks	⅛ cup	2 tablespoons
1 peck	8 quarts	1/16 cup	1 tablespoon
1 cup	16 tablespoons	1 tablespoon	3 teaspoons
⅞ cup	14 tablespoons or 1 cup minus 2 tablespoons	¾ tablespoon	2¼ teaspoons
¾ cup	12 tablespoons	⅔ tablespoon	2 teaspoons
⅔ cup	10⅔ tablespoons	½ tablespoon	1½ teaspoons
⅖ cup	10 tablespoons	⅓ tablespoon	1 teaspoon
½ cup	8 tablespoons	¼ tablespoon	¾ teaspoon
		Pinch or dash	1/16 teaspoon

### References

Handbook of Food Preparation, Eighth Edition. American Home Economics Association, Washington, D.C.

"Ingredient Substitution and Equivalent Chart," Circular HE-585. Oleane Carden Zenoble, Alabama Cooperative Extension Service, Auburn University.

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