Whole Grain (WG) Flours or Meal may be milled from many different kinds of grains and must contain all the grain’s parts: bran, endosperm and germ. The grain may also be sprouted first, then milled. After milling, the product may be fine, coarse, rolled, cracked, flaked, stone ground or graham.

Whole grain-rich: 50% (1/2) or more of the grain ingredients are whole grain. “Rule of Three” (on food labels): The first ingredient (or second after water) must be whole grain; the next two grain ingredients (if any) may be whole grains, enriched, bran, or germ. In recipes, half (or more) of grain ingredients should be whole.

EXTRA! Today’s grains may be called ancient (thousands of years old…corn, sorghum or ancient wheats such as einkorn, emmer, spelt), heirloom or heritage (pre-1960/70s), and modern (grown since 1970s). Any of these may be whole grain, or not.

The ingredient label tells if an ingredient is whole grain or enriched, bran or germ (partial grain) or de-branned or de-germinated.

Whole grain may or may not be organically grown. Some grains are GMO and some are not—wheat flour is always “non-GMO,” corn may not be.

Learn more: WheatFoods.org; wholegrainscouncil.org

Organic and GMO defined: foodinsight.org
See “How Flour is Milled” and view “Flour Food Safety” videos, namamillers.org (Click Education and News Room)

Flour is NOT just Flour. Bakers rely on a grain’s protein and gluten qualities for volume and structure. Gluten is made of two nutritious proteins found in some grains—glutenin and gliadin. When gluten containing flour mixes with water, a stretchy structure develops that holds leavening gas (CO2). The mixture expands and when baked, becomes firm. Gluten-free structure comes from Xanthan or guar gums, and sometimes eggs. Additional leavening is often added.

<table>
<thead>
<tr>
<th>Grains w/Gluten</th>
<th>Gluten-Free (GF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgur wheat</td>
<td>Amaranth flour</td>
</tr>
<tr>
<td>Rye, flour, groats, sprouted</td>
<td>Brown rice flour</td>
</tr>
<tr>
<td>Spelt, berries, flour</td>
<td>Corn, whole grain flour, meal, grits</td>
</tr>
<tr>
<td>Triticale, berries, flour</td>
<td>Oat, rolled, quick, flour, instant, steel-cut</td>
</tr>
<tr>
<td>Wheat, white or red*</td>
<td>Sorghum flour</td>
</tr>
</tbody>
</table>

*Whole wheat flour is milled from hard (all-purpose and bread flours) or soft (biscuits, pastries, cookies, cake flours) wheat and may have red or white bran. It may be sold as whole berries, cracked, flaked or rolled, groats or sprouted grain flour. (Flour 101, WheatFoods.org)

Baking Whole Grain Tips

+Bake with a well-tested (standardized) recipe. Most good recipes may be baked as a whole-grain product.

+Start with half whole grain. Identify the amount of enriched all-purpose or bread flour in the recipe. Divide the amount in half. Substitute a whole wheat flour for half the flour. (EX: For 2 c. all-purpose or bread flour substitute 1 c. whole wheat flour and 1 c. all-purpose or bread flour)

+Measure or scale flour accurately. 1 cup flour = 4.25 oz /120g “Fluff, spoon, level” or use a scale. View How to Measure Flour, http://homebaking.org/glossary/old_glossary.html#F

+For a lighter appearance and flavor use white whole wheat flour (read package label). Standard whole wheat flour is produced from red wheat and has a darker bran color.

+For yeast breads, use hard whole wheat flour (red or white)

+Find the whole grain version. For de-germinated cornmeal, sub one for one whole grain cornmeal.

+Want multi-grain? Create your own blend to sub for ¼ (25% and no more) of the enriched or whole wheat flour.

+More liquid needed? Not if veggies, fruits or buttermilk are included. If batter/dough seems dry, add 1-2 T. liquid.

+Bake together, eat better. When children help, they’re much more likely to try and adopt whole grain foods.

+Find lessons, recipes and more at HomeBaking.org
**Whole Wheat Dinner Rolls**

**Ingredients**
- Makes 15, 1.75 oz. rolls
- 1 cup (8 fl oz) whole milk, scald and cool*
- 1 pkg (7g) Platinum™ or quick-rise yeast
- ½ cup (2 oz/115g/1 stick) unsalted butter
- 1/3 cup (2 oz/57g) chopped pecans (opt.)
- 2 large (4 oz/113 ml) eggs
- ½ teaspoon salt
- 3 1/3 cups (14 oz/400g) whole wheat flour

**Mixing Option:** 2 T. melted unsalted butter mixed with 2 tsp. honey
Pinch coarse Kosher salt

**Directions:**
**STEP 1: Make the dough.**
- Microwave milk until steaming; pour into mixing bowl and cool to 110°F.
- Whisk together with yeast; cover for 5 minutes. On low speed or by hand, mix in butter (cut in 4 pieces), honey or sugar, eggs and salt. If butter’s lumpy—don’t worry! Continue on low-speed to gradually add flour, ½ cup at a time.
- Once flour is all in bowl, knead on medium high 6-7 minutes. Dough will pull from sides but gently bounce back. If too sticky, add 1-2 Tbsp. flour and mix; if too dry, 1-2 Tbsp water. Knead into smooth ball, lightly grease top and cover loosely with plastic wrap. Place in 70° (warm) place until doubled, ~1 ½ hours. Deflate dough. (Two-day plan: Tightly cover and refrigerate dough 1-2 days-deflate again. Bring to room temperature, then shape.)

**STEP 2: Shape the rolls.**
- Grease a 9 X 13-in baking dish. Flatten the dough into 8 X 12-in rectangle; use pizza wheel to cut 2 X 4 cuts (see photo). Arrange in pan, loosely cover with plastic wrap. Proof in warm (100°F) place to double, ~1 hour.

**STEP 3: Bake the rolls.**
- Preheat oven to 375°F. Bake rolls 20-25 minutes until golden and 190°F at center. Brush with optional butter/honey mix and small sprinkle of coarse salt. Serve warm.

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**Carrot Apple Muffins**

**Makes 12, (2.25 oz) muffins**

**Ingredients**
- 1 cup (4 oz/113ml) whole white wheat flour
- ½ cup (2 oz/58g) multi-grain hot cereal*
- ¼ cup (2.1 oz/60g) all-purpose flour
- ½ cup (3.8 oz/105g) sugar
- 1 Tablespoon (0.5 oz/13g) baking powder
- ½ teaspoon (2g) baking soda
- ¼ teaspoon (3g) salt
- 1 teaspoon ground cinnamon (optional)
- 1 cup (3.7 oz/105g) shredded carrots
- 1 cup (4.4 oz/125g) apples, peeled, chopped (no need to peel if thin-skinned)
- ½ cup (4 fl oz) low fat milk
- ¼ cup (1.9 oz/55g) vegetable oil
- 2 large eggs (4 oz/113ml)
- 1 teaspoon vanilla
- ½ cup (2 oz/57g) chopped pecans (opt.)

*Hodgson Mill Multi-grain cereal OR make ½ c. oat/flax/corn meal (multi-grain) mixture

**Directions:**
- Preheat oven 400°F. Paper line or grease 2 ½-inch medium muffin cups.
- 2. Wash and shred carrots and apples.
- 3. In a medium mixing bowl measure flours, hot cereal, sugar, baking powder, baking soda, salt and cinnamon (if desired). Whisk to blend thoroughly.
- 4. In a small bowl, measure and whisk together the milk, oil, eggs and vanilla.
- 5. With a spoon mix the liquid mixture, shredded carrots and apples and nuts into the dry mixture just until blended.
- 6. Use a 1/3 cup scoop to portion batter evenly into the 12 paper-lined or greased muffin cups. Bake 20 to 22 minutes until golden brown and 200°F at center.

7. Cool on wire rack. Serve warm or they’re even better the next day!

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**Whole Grain Gluten-Free Baking**

This mix may replace gluten-containing flours in some standard recipes. Slightly more leavening may be needed.

For structure, add xanthan or guar gum based on package directions.

**Basic guide:** For each cup GF flour mix:
- Quick breads: ¼ to ½ tsp. xanthan gum
- Yeast breads: 1 to 2 tsp xanthan gum/cup

**Whole Grain Gluten-Free Mix**

(Makes 9 c/43.25 oz) Blend well with whisk 6 cups (28.5 oz) brown rice flour
- 2 cups (10.75 oz) potato starch
- 1 cup (4 oz) tapioca starch or flour

**Source:** Gluten-Free Baking Guide

**Whole Grain Baking Guide**

KingArthurFlour.com

**Test-kitchen GF Recipes:**

Hodgsonmill.com
KingArthurFlour.com
Panhandlemilling.com
Redstaryeast.com

A Bakers Dozen Labs, HomeBaking.org