

Rising Dough: Baking with Whole Grains

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Baking with whole grains can be a challenge. This is a workshop to discuss the production, processing, and use of whole grains. Our instructors include a few farmers, mothers, and a chef – or in some cases a combination of the three. We are delighted that you can join us tonight for tasty breads and a lively presentation.

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An Introduction: by Parker Bosley

Bread baking begins as science with careful measuring, attention to temperature, types of flour, how the flour is milled and the way in which the grain was produced.

As we mix and knead the ingredients together bread baking becomes less about science and more about art. You begin to interact with the product. Touch, aroma and appearance, along with our personal preferences of taste and texture, become very important.

Don't be intimidated. Don't be afraid to try. Do make the bread your bread. The loaf should be appealing to you and your family. Practice, practice, practice. Do a little experimenting. Remember that the goal is to make your version; a loaf that you and your family will enjoy.

Bread baking is usually motivated by one of two issues. One reason is that we bake because we are concerned about the sources of the ingredients and what may have been added to the bread to increase its shelf life, to enhance its appearance or to alter the taste. Baking bread in our own kitchen gives us control of what we eat.

On the other hand many folks choose to bake bread for the pleasure and personal satisfaction one gets from the process. It's therapeutic. Liquid, flour, salt and yeast, the basics, are transformed by the baker to create the staff of life—as bread is called. Creating a loaf of bread is an achievement as well as a moment of personal satisfaction.

Interpreting the science side of baking:

Factors that may affect your recipe:

- 1) ***The type of flour you use.*** What variety, the grind, how fresh it is, and even where it was grown.
- 2) ***The temperature of liquids, the room and your oven.*** These factors influence the way that the yeast reacts with other ingredients and how your bread rises. Adjustments can be made to the amount of time you knead the bread to compensate for these outside factors. As to the water, remember that adding very hot liquid to yeast will kill the yeast just as the heat of the oven does.

Bread Baking Basics:

Ingredients:

About Yeast:

Yeast is a microorganism – a bacterium – used in bread baking to create carbon dioxide, which causes the dough to rise. The yeast, similar to other bacteria used in beer making or sauerkraut, lives in an environment without air (anaerobic). It consumes carbohydrates to create carbon dioxide.

The most reliable and easy to measure kind of yeast is **active dry yeast**. You can store it in the freezer indefinitely.

Proofing the yeast means just that. You prove that it is living and will grow. Many recipes instruct you to proof the yeast. Here is a tried and true method for proofing yeast:

- 1) Measure out the amount of water needed for the recipe. With a thermometer, heat it to between 110 and 115 degrees. That is our definition of warm.
- 2) Add just a pinch of sugar. This will be food for the yeast and will help you more easily see if the yeast is alive. (Some recipes already call for honey or sugar. Adjust accordingly as to not over-sweeten.)
- 3) Pour the yeast into the bowl. Stir gently.
- 4) You will begin to see bubbles or foam. The yeast is active and is good to use. Let sit for at least 5 minutes.

Flours/Grains: The wheat berry is made up of bran (the shell), endosperm (the starch), and germ (the nutrients used for growing a new plant). All-purpose white flours have the bran and germ removed so that the flour is starchier. The bran is important for nutrients, fats, and fiber. The germ is the embryo for the seed (a wheat berry is a seed) and contains essential fatty oils.

About Gluten/Protein in Flour:

Gluten is a combination of proteins in flour that is stretched during the proofing stage (rise). Think of the gluten molecule as a balloon that is getting inflated. The gasses released from the fermentation of yeast and carbohydrates are trapped in the molecule, expanding it.

High gluten, or hard, flours are used for breads while low gluten, or soft, flours are used for cookies and cakes. Hard flours have higher protein and can develop more gluten. Hard flour

may have a protein content as high as 14% while a soft flour may have a protein content as low as 8%. Most all-purpose flours are a medium protein of about 12%.

In bread baking, gluten helps the bread hold its structure. For pan breads gluten and protein are not as important as hearth baking. The loaf is held together by the pan. But in free form loaves baked directly on a stone, the gluten and protein help create the structure and the shape.

For the recipes included here, whole wheat flour is an “all purpose blend” of soft and hard wheat. A good blend is approximately 40% soft and 60% hard, but that also varies based on the brand of flour due to protein levels. Our brand is a local brand called Stutzman Farms.

Salt: We recommend using a fine to medium grind sea salt, kosher salt, or mineral salt, such as Pink Himalayan.

Water: Each person’s water varies. Hard waters may toughen dough or slow the fermentation of yeast. Soft waters may create sticky dough. One trick is to use bottled spring water for consistent results.

Baking with whole wheat flours can be challenging because the breads tend to be drier or harder. This is because the recipe hasn’t been properly adjusted for whole wheat flours. In a recipe in which you are substituting whole wheat flour, add 1 to 2 tablespoons of water for every cup of whole wheat flour. This is because the bran and high-protein content of whole wheat flour absorb more water.

Fats: Butter (usually unsalted) or oil can be used in bread baking to provide a longer shelf life and crispier crust on the bread. Using too much fat, however, will result in less rise (less volume). An easy way to understand this is to think about cookies. Cookies have some of the same ingredients as bread. However, they have a lot more fat, which “shortens” the gluten molecules and therefore the rise by weighing them down (hence the term shortening).

Techniques:

For all of us, our goal is healthy, artisan breads. True artisan bread – with a thick, crunchy crust and chewy inside - isn’t possible with whole grain flours. However, by understanding these techniques below we can try our best to get there.

Oven Temperature: Artisan breads are usually baked on a hearth (stone) at very high temperatures and high humidity. This helps form a good crust.

If you are baking hearth baked bread, you would start with a high temperature, usually between 425 and 450 degrees. To prevent the crust from forming too quickly, the oven humidity is increased. To do this at home, place a shallow pan of water or throw some ice cubes into a preheated pan in the bottom of your oven.

For bread baking (yeasted doughs) with whole grains, we are baking in a pan. For pan baking, the high heat isn't needed to immediately set the proteins (and give the loaf form). Instead, the pan gives the loaf form.

In a pan, with yeasted doughs, one should bake at lower temperatures (350) and extend the baking time to yield softer breads. If one were to rise the baking temperature, the result would be a harder exterior and softer, underdeveloped interior.

If the recipe calls for baking powder, such as in a muffin recipe, it is OK to use higher temperatures such as 400 degrees because the baking powder "springs" faster (it creates the chemical reaction that causes the batter to rise).

The Baking Pan/Stone: The temperature of your oven and the pan on/in which the bread is baked greatly affects the characteristics of the baked bread. Not all ovens cook evenly or have the indicated temperature that you set it at. If you want to get serious about bread baking, get a separate oven thermometer to understand the temperature of your oven where the bread will be.

Similarly, bread that is baked "free form" (without a pan) should be placed on a pre-heated baking stone. For breads baked in a loaf pan, the bread is "proofed" in the pan. Therefore, it is not possible for the bread to get that immediate blast of high heat that it would get when it touches a pre-heated baking stone. In a pan, the bread is protected by the pan.

The pan's job is to help the bread hold its form and a good pan should help evenly distribute heat. Tin and aluminum pans have the least thermal capabilities. Aluminum does heat up faster than stainless steel or steel, but steel has the ability to even out temperatures more. Cast iron, enameled iron, and stoneware are much heavier and do help distribute the heat. The difference between a glazed and unglazed stoneware pan is that the unglazed one will allow some additional moisture to escape and can create a crustier bread.

Also, heavy bread pans take time to heat up (and cool down). That means that the top of the bread that is exposed to the radiant heat of the oven will cook faster than the sides. Expect to have a crustier top and chewier inside. If more moist bread is desired, use a lid to cover the stoneware bread pan. This is a way to increase the humidity similar to a steam injected oven in a professional bakery.

Finally, one consideration is that while a heavy loaf pan takes time to heat up, it also takes time to cool down. If you don't plan on removing the loaf from the pan immediately, you will need to remove the pan from the oven before the loaf is fully done cooking as it will continue to cook in the pan.

Oven Moisture: For pan baked breads, additional oven moisture is not needed. However, if you are trying to bake on a stone a free-form bread, additional moisture will be needed to prevent the exterior crust from setting too fast (and therefore preventing additional rise of the dough).

For free-form baking, place a pan of water in the bottom of your oven. Start with a half a cup of water so that it evaporates quickly. Experiment with different amounts of water for different results. Each recipe will react differently to the additional humidity.

Washes:

Using an egg glaze/wash: Used to create a shiny glaze and can be used to "glue" ingredients to the outside, like nuts or seeds. Here is how to create an egg wash:

- 1) Start with a room temperature egg yolk. A cold egg yolk could shock the yeast reaction happening in the bread.
- 2) Beat an egg yolk with a few drops of water and a pinch of salt. Use no more than a half a teaspoon of water or milk.
- 3) Use a brush to paint the top of the dough. Be careful near the edges. If the glaze should run down the sides of the dough, it will cause the finished product to stick to the pan.

An egg wash can also be created with the whole egg or just the egg white as well. Each changes the color of the finish. The egg yolk, without water, provides the deepest color. Water lightens the color more than milk. The egg white can be nearly transparent and an excellent choice for adhering nuts or seeds to the surface. You can use the egg white to make a shinier surface or you can use the whole egg.

After baking and before the bread or rolls have cooled, brush with butter to brighten and soften the crust.

Bread Baking Resources:

A very good source of Whole Wheat baking is a book published in the eighties: The Laurel's Kitchen Bread Book by Laurel Robertson. It is still in print—used copies are about \$5.

Recipes from the Old Mill: Baking with Whole Grains by Sarah E Myers and Mary Beth Lind

Recipes

Whole Wheat Sorghum Bread

By Parker Bosley

2 tsp yeast dissolved in 1/8 cup lukewarm water (Do this in the mixing bowl.)

¾ cup milk combined with ¾ cup warm water

1 TBS very soft lard or butter

2 TBS sorghum syrup or honey

1 TBS salt

4 ½ cups whole wheat flour, plus ½ cup as needed

Dissolve the yeast in the lukewarm water in the mixer bowl. After five minutes, add the milk and water. Whisk in butter or lard and the sorghum syrup.

Add the flour and salt.

Using the dough hook and the lowest mixer speed, begin the mixing process. Bring dough together. This will take time. If there are some of the dry ingredients on the sides or in the bottom of the bowl turn off the mixer and use a rubber spatula to bring these into the dough. Continue to knead the dough for about five minutes.

If the dough is very firm and does not come together, add a little water one or two teaspoons at a time. If the dough is sticky you can add a little more flour. You should be able to form the dough into a ball without its sticking to your hands.

Place the dough on the counter top and knead it for two or three minutes. This gives you an opportunity to feel the texture of the dough. Create a ball.

Place the dough in a bowl that has been rubbed with a small amount of lard or butter. Cover with a cloth or piece of plastic. Let the dough rise for two or three hours at room temperature. It should double in volume.

Punch it down and reform into a ball. You will feel how the dough has relaxed. It should be softer and more pliable. Return the dough to the bowl. Let it rise again for about an hour. It does not have to double in volume.

Rub a thin coating of butter or lard on the bottom and sides of a 5x9 bread pan. Roll the dough into a log and place it in the bread pan. Cover and let it rise until it is doubled.

Bake the loaf in a 350 degree oven for about one hour.

Remove from the oven. Turn the loaf out of the bread pan and let it cool on a bread rack.

If you wrap this loaf in plastic it will last for three or four days. When it is completely cool you can cut it in half. Wrap each half tightly in plastic and freeze one half.

Making the dough by hand:

Place all the liquid ingredients, except the flour, in the mixing bowl. Combine those ingredients. Add half the flour. Mix with a spatula or large wooden spoon until you can turn the dough out on to the work surface. Continue adding flour and kneading the dough. When the dough comes together, let it rest for five minutes. The flour will absorb the moisture.

Continue to knead the dough and add more flour until it does not stick to your hands or the work surface.

Whole Wheat Crêpes

By Parker Bosley

1 cup flour (see Note below)
1/2 tsp salt
1 TBS sugar or honey, optional
3 eggs
1 cup milk
2 eggs
2 TBS melted butter

Place the dry ingredients in a mixing bowl. Add the eggs and combine with the flour. Slowly add the milk to create a smooth batter. Set aside for at least an hour.

When ready to make the crêpes, add the melted butter.

It will take a couple of practice runs to get the right temperature and the thin or thickness of the batter. Add a couple of teaspoons of water to the batter to thin it.

Heat a 6 inch (see note) non-stick sauté pan to medium high. Brush the pan with butter. Use a 1 ounce ladle to pour batter into the middle of the pan. Immediately tilt and rotate the pan to cover the entire surface of the pan with the batter. Return the pan to the heat. Cook the crêpes for 30-45 seconds. Use a rubber spatula to flip the crêpes. Cook the second side.

Stack the crêpes between parchment papers and keep warm.

Note: Flours from Stutzman's that can be used: Whole Wheat Flour, Whole Spelt Flour, Red Winter All Purpose Flour. Or, a combination 80% whole wheat and 20% all purpose; a similar combination of spelt and whole wheat or all purpose.

Note: Crepe Pans are measured from rim to rim rather than the interior surface. If you use a 10 inch pan use 1 ½ - 2 ounces of batter.

Savory Crêpes: Thaw and heat slowly some frozen corn. Season the corn with salt and pepper. Place a tablespoon of corn on the crêpe and roll to create a tube shape. Add 1 cup of corn (precooked to evaporate liquid) to the batter. Stir each time you make a crêpe. The corn will be part of the crêpe.

Sweet Crêpes: I think the spelt flour or a combination of 80% spelt flour and 20% all purpose flour with a little sugar produce great dessert crêpes. Fill the crepes with jam. Fold in half and then in quarters. Dust with powdered sugar. Add a side of Snowville Creamery's Crème Fraîche.

Whole Wheat Muffins

By Parker Bosley

1¾ cups flour
¾ tsp salt
¼ cup sugar
2 tsp baking powder

2 eggs
3 TBS melted butter
¾ cup milk

Mix the dry ingredients together in a bowl. Whisk the eggs and milk together. Add the liquid to the dry ingredients. Do not beat to make the batter smooth. Add the melted butter and combine with the batter. Spoon the batter into buttered muffin tins filling each of the molds about 2/3 full.

Bake for about 25 minutes at 400 degrees.

This recipe will yield 20—24 small muffins.

Whole Wheat and Spelt Dinner Rolls

By Parker Bosley

2 TBS warm water
1 TBS yeast
1 cup hot milk
1 tsp sugar
2 TBS melted butter

¾ tsp salt
1 egg
2 cups whole wheat flour
1 cup spelt flour

Sprinkle the yeast over the warm water in a separate bowl. Place the milk in a mixing bowl with the butter, sugar, and salt. Stir to combine. Add the softened yeast to the milk mixture. Beat in the egg and add the flour. In a stand mixer, use the dough hook to knead the dough. Keep the mixer on lowest speed.

Making the dough by hand: Mix half the flour(s) into the liquids and the egg. Continue adding flour and mixing until the dough can be turned out on to the work surface. Begin kneading and continue adding flour until the dough is smooth and can be handled without sticking to your hands.

Place the dough in a bowl that has been buttered. Cover and let the dough double in volume.

Butter two muffin pans to make 12 rolls. Pull pieces from the dough and create balls about the size of a quarter. Place three of these in each muffin mold. Cover the filled muffin trays with a cloth and let the dough rise again. The rolls will double in size.

Bake in a 425 degree oven for about 20 minutes. Remove from the oven and turn the rolls out of the muffin pan. Set them upright and brush with butter.

Healthy Heritage Whole Grain Bread

By Joel and Christina Kurtz

4 cups warm water

1/3 cup honey

1 cup olive oil

2 Tbls lemon juice

Place all liquid ingredients into Bosch mixing bowl and then add the following:

3 Tbls instant yeast

10 cups freshly milled Prairie Gold wheat

2 Tbls salt (we find Real Salt or Himalayan salt work best)

Mix until all is very soft dough. Then add by half cup increments up to 2 more cups of PG flour until the dough pulls away from the side of the bowl. When touched with wet fingers it should not stick to your fingers. Knead on Speed 3 in Bosch for 6 minutes. Shape and place in bread pans and let rise until 1 inch above pan. Bake at 350 degrees for 30-35 minutes or until nicely brown. Makes 4 large loaves.

You can use a combination of grains in this recipe. We always use Prairie Gold at the bread demos. You can use Spelt, Kamut, or Bronze Chief to find the flavor you like best.

Whole Wheat peanut Butter Cookies

By Joel and Christina Kurtz

1 ½ cups soft butter

1 cup evaporated cane sugar

2 ½ cups peanut butter

1 Tbls vanilla

4 large eggs

4-5 cups Kamut/Prairie Gold/Spelt

2 tsp baking soda

1 tsp salt

Mix flour, soda, and salt in bowl and set aside. In Bosch or with mixer cream together butter, sugar and peanut butter. Then add vanilla, eggs and cream for 3 minutes. Mix dry ingredients into the creamed mixture. Let dough set for at least 30 minutes. Place by spoonful onto cookie sheets and flatten with a fork dipped in flour.

Bake at 350 degrees for 10 minutes or until done. Cool. Makes about 8 dozen. I use any one of the three grains listed above to make the cookies.

A good thing to remember when baking cookies with whole grains is to hold back on flour by ½-¾ cup and let set for ½ hour or more before baking. Also do not overbake.

Sweet Molasses Cookies

By Joel and Christina Kurtz

Cream together:

1 ½ cup molasses 1 cup soft butter

Then add 2 eggs and beat well

Add:

½ tsp ginger ½ tsp cinnamon

1/8 tsp salt 2 tsp baking soda

Stir in:

1/3 cup milk 4 ½ cup whole wheat flour

Mix well. Drop by teaspoonfuls on greased cookie sheet. Bake at 350* for 10-15 minutes, until they are light and golden. *This recipe is from "Healthy Choices" cookbook*

Hearty Grain Bread

From "Recipes from the Old Mill"

Yield: 4 loaves

½ cup honey 1 cup rolled oats

4 cups warm water 1 cup raw bulgur

3 pkgs dry yeast 1 cup wheat bran

4-5 cups flour 1 cup sunflower seeds

½ cup oil 1 Tbsp salt

3 cups whole wheat flour

Combine water and honey; add yeast and dissolve. Add 2 cups flour, mix well. And let stand 10-15 minutes. Add oil whole wheat flour, oats, bulgur, bran, seeds, and salt.

Add enough additional flour to make a stiff dough. Knead until smooth and elastic, approximately 10-15 minutes. Cover and let rise until double, approximately 1-1/2 hours.

Punch down and divide into 4 balls. Cover and let rest 15 minutes

Shape into loaves. Roll loaves in rolled oats and place in greased 8" x 4" pans. Cover and let rise, approximately 1 hour.

Bake at 375* for 30-40 minutes.

100% Whole Wheat French Bread

From "Recipes from the Old Mill"

1 pkg dry yeast	2 ½ tsp salt
½ cup warm water	1 ½ cups cold water
5 ½ cups whole wheat flour	

Dissolve the yeast in warm water. Stir together flour and salt. Add yeast and cold water to flour mixture. Mix well. Add at least ½ cup more cold water by wetting your hands as you knead. Knead dough at least 20 minutes. Dough should be quite soft and silky. Cover and let rise in a place that is cooler than 70 degrees for 2 ½ -3 hours.

Punch down gently with wet hands, trying not to tear the dough. Cover and let rise again in a cool place for approximately 2 hours. Gently punch down and shape into 2 balls. Cover and let rest while you prepare your paking pans.

Generously dust baking sheets with cornmeal. Shape the balls into long slim laoves and place on baking sheets. Let rise, uncovered, about 1 hour in a 70 degree place. Cut slashes in dough, if desired. Preheat oven to 450 degrees. Spray the proofed loaves with warm water and quickly place in the hot hoven. Avoid oven heat loss. For crusty bread, place a shallow pan with boiling water on the oven rack below the one the loaves are on. After 10 minutes, reduce oven to 350 and bake until done, about 25-30 minutes.

Whole Grain Pie Crust

By Joel and Christina Kurtz

In Bosch mixing bowl with whisks combine the following:

2 cups soft butter

½ cup milk

1 ½ tsp salt

½ cup cold water

Then slowly add 7 cups of freshly milled soft white wheat.

This recipe makes 7 single pie crusts

Homemade Doughnuts

By Stutzman Farms

2 cups warm milk
1½ Tbsp. yeast
1 cup mashed potatoes
½ cup butter

2 beaten eggs ½ Tbsp. salt
¼ cup sugar
5 cups golden white spelt flour

Dissolve yeast in warm milk, Add potatoes, butter, eggs, salt and sugar. Stir in flour. Let rise 2 hours. Roll out and cut with doughnut cutter. Let rise again and fry. Glaze while still hot. Makes about 4 dozen

Glaze

1 pound powdered sugar, 2 Tbsp. corn starch, 1 tsp. soft butter ½ tsp. vanilla. Mix then add hot water by very small amounts until a thin paste forms.

Sprouted Spelt Bread

By Stutzman Farms

1/3 cup oil
¼ cup honey
1½ cups warm water
2 tsp. salt

1 Tbsp. instant yeast
2 tsp. arrowroot powder
6-7 cups sprouted spelt flour

Mix together oil, honey, and water in mixer. Mix all dry ingredients and add half of this mixture to liquids and mix well. Add the other half of the dry ingredients. Add more flour as needed. Let dough rise for 7 minutes and form into loaves and place in loaf pans. Let rise until even with pan and bake at 350 degrees for 30- 40 minutes. One large or two small loaves.