Whole Wheat Bread Making

From the kitchen of Tammy Hulse

*With excerpts from "Secrets of the Masters Made Easy—Whole Wheat Bread Making", by Diana Ballard

Why Whole Wheat?

Wheat is also known as the "staff of life". It is the most nutritious grain for man on the earth. It is especially rich in B vitamins and protein and fiber. It also contains several other vitamins and minerals.

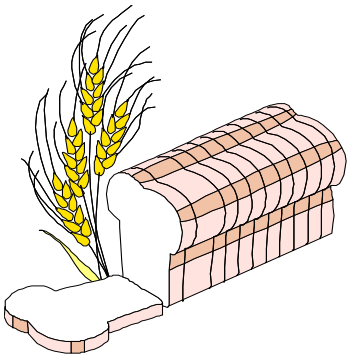
White flour has been refined and has had both the bran and the wheat germ removed. The wheat bran is an excellent source of fiber and the wheat germ is rich in B vitamins, iron, potassium, magnesium, zinc and protein. It is also a natural source of Vitamin E.

Purchased wheat flour typically has the germ removed to improve shelf life.

Wheat flour is one of the least expensive sources of high quality protein you can buy. It costs about $.15 per pound compared to animal protein that is about $2.00 per pound.

If wheat allergy or sensitivity is a concern, the spelt grain may be a good alternative. Spelt is the original wheat grain before hybrid grains were developed. Many people with wheat allergies have been able to tolerate spelt without a problem. *(People with a true gluten allergy should not use spelt)*

When selecting wheat for bread-making, it is important to look at the protein content. Hard white or hard red wheat with high protein (16-20%) is ideal. If the wheat contains less than 16% protein, gluten flour will need to be added to the bread.



***Special points of interest:**

- *A wheat kernel is divided into three main parts; the outer layer, called the bran; the inner starchy layer, called the endosperm; and the tiny embryo at the base of the kernel, called the germ.*
- *The outer layer, or the bran makes up 14% of the kernel and is removed when making white flour*
- *Most of the B vitamins are contained in the bran layer*
- *B vitamins strengthen the nerves. If stress is a part of your life, you can really help yourself by including whole wheat in your diet*

The principles of good bread-making are always the same. Learn the principles, then you can vary the ingredients and still get excellent results.

The key to successful bread making is PRACTICE

Equipment

The following is a list of basic equipment that will help ensure your success:

- Liquid and dry measuring cups, measuring spoons
- Wheat grinder
- Spatula or large spoons
- Electric mixer or large bowl *(the whole process can be done by hand if necessary)*
- Rolling pin
- Thin cloths to dampen and cover rising loaves
- Cooling Racks
- Standard size baking pans (7 1/2 inches long, 3 1/2 inches wide on bottom, 2 3/4 inches deep *(deeper pans are OK but wider pans tend to cause problems)*

*Purchasing and Grinding the Wheat

If you choose to buy wheat to grind yourself, select hard white spring wheat or hard red winter or spring wheat. If you are able to eat whole wheat products without digestive difficulty, either wheat will be satisfactory. However, if you have digestive difficulty, the white wheat seems to be easier on the digestive tract.

The wheat should be high in protein (16-20%). Soft wheats are used for pastry flour and can be used in cakes and cookies but they do not make good bread. "Baker's Quality" wheat contains the two types of protein necessary for gluten development and should be used for bread making. ***The type of hard wheat you select for use in bread-making is the single most important factor for your degree of success!***

Milling Wheat: Wheat needs to be milled fine enough to allow the gluten framework to develop. If it is too coarsely ground, the gluten will not develop. Most electric mills are designed to give a pastry fine flour in the finest setting. Bread flour does not have to be that fine, so the next setting works very well. One cup of grain yields 1 1/2 cups of flour

Storing Wheat flour: Freshly ground flour may be stored for few weeks at room temperature. If a longer storage life is desired, you can store it in the refrigerator or freezer. Let the flour come to room temperature before making bread.

Wheat Bran: Freshly ground wheat is a great source for dietary fiber but that fiber can damage the gluten framework during kneading and rising. To make a good wheat bread, do not add extra wheat bran to the dough. It is also important to have the dough rise only once.

Wheat germ: The nutrition in the wheat germ is valuable in whole wheat bread, but it contains an agent that will break down the gluten. For this reason it is important to not add any additional wheat germ to the bread. Simply enjoy the amount of wheat germ that is naturally there.

*Ingredients

Substituting other flour: If you choose to put any white flour in your bread it should be labeled "Better for Bread" as opposed to "All Purpose". Up to one-third of the whole wheat flour in any bread recipe may be interchanged with either bleached or unbleached white flour. You can also substitute cracked wheat for some of the flour. It should be no more than 1/8 of the flour in the recipe and should be soaked over night to soften it.

Yeast: Yeast is a living plant and needs warmth and moisture to grow. There are three different types of yeast to purchase. (1) Compressed yeast is the most powerful with the greatest rising ability, but it is harder to find. It must be used within 6 weeks and added directly to the bread dough. (2) The next most powerful is instant, rapid-rise yeast. This yeast does not need to be pre-softened in warm water. It may be added to the bread dough after the first 1-2 cups of flour have been added. (3) Active Dry Yeast. This is the least powerful and must be softened in warm water for 5-10 minutes before adding it to the other ingredients.

Instant yeast is easy to find in the grocery store and is the type of yeast I prefer using. It is best to store instant yeast in a freezer between 0-10 degrees F. A lower temperature could kill the yeast; a higher temperature will shorten shelf life.

Liquid: Water, milk, potato water, or buttermilk can be used in bread-making. Water allows the flavor of the wheat to be more pronounced. Milk causes the bread to toast more evenly and quickly. Breads stay fresh longer when made with milk. Potato water gives greater volume but a coarser texture. Buttermilk causes the dough to be more tender and will give a distinctive flavor to the bread. If you choose to use buttermilk, use it only for 1/2 the liquid, and use water or milk for the other 1/2.

Oil and Fat: This is used to increase elasticity and to produce a more tender crumb. Volume will increase, bread browns more evenly and will stay fresh longer. One tablespoon of oil for each cup of flour is a good amount. A good quality oil (olive, flax seed, grapeseed, sunflower, or canola) or butter can be used in bread. Shortening or lard contain poor quality fats and should be avoided.

Salt: Salt brings out the flavor of the other ingredients and controls the fermentation process. If salt needs to be deleted for health reasons, it is important to watch the dough carefully so that it doesn't rise too high at any stage.

Sugar: Sugar feeds the yeast and adds flavor to the bread. Too little sugar prevents oven browning and too much causes excessive browning. White sugar, brown sugar, honey or molasses may be used.

Gluten Flour: (Also called Vital Wheat Gluten) is extracted from high protein wheat. If your wheat protein is less than 16% you need to add gluten flour. I prefer using gluten flour in all my breads, even if the protein in the wheat is above 16%.

Dough Enhancer: May contain any combination of whey, ascorbic acid, salt, corn starch, lecithin, tofu and flavorings. Some components provide food for the yeast, other components repair and strengthen the gluten to improve the quality of the bread.

Eggs: Add a rich golden color to bread and improve the texture. Eggs cause the bread to rise higher and stay fresh longer. One egg is equivalent to 1/4 cup liquid in your recipe.

The Bread Making Process

The procedures followed in preparing various yeast breads are basically the same. The basic steps are outlined below along with an explanation of why these steps are important.

1. **Scald the milk.** (if milk is used as the liquid). Milk contains an enzyme that will break down the quality of the dough and make it sticky. The enzyme is deactivated by heating the milk to 198 F for 1 minute or 185 F for 7 minutes. Any milk, except evaporated milk must be scalded before adding.
2. **Mix sugar, fat, and salt with liquid.** Place sugar, fat and salt in bowl. Pour in scalded milk or hot water. Stir to mix ingredients and melt the fat.
3. **Stir in 1/2 to 1 cup of the flour.** This will result in a lumpy mixture. This will tie up the fat so that the yeast will not be coated by fat when it is added.
4. **Check temperature of the mixture before adding yeast.** The mixture should not be warmer than 105 F. The simplest way of checking is to insert a well washed finger directly into the mixture. If it feels approximately body temperature or only slightly warm, the yeast can be added immediately.
5. **Add remaining ingredients and 1/2 of the remaining flour.** The mixture should be sufficiently viscous to permit vigorous beating. The dough is mixed vigorously for approximately 2-3 minutes. The mixture should become quite smooth and develop a cohesive quality as gluten develops.
6. **Gradually add more flour to make a soft dough.** *Add just enough flour to make the dough easy to handle without being sticky.*
7. **Knead the dough.** This will take about 5 minutes on medium speed with an electric mixer. If you allow the mixer to knead the dough too long, it will begin to tear instead of stretch as it kneads. At this point, the gluten has been damaged and cannot be repaired. If kneading by hand, fold dough in half, then push away with the heel of the hand. Rotate the dough 90 degrees and do it again. Hand kneading takes anywhere from 5-15 minutes. *The gluten is developed sufficiently when the dough loses its stickiness and becomes stretchy and elastic and small blisters can be seen just under the surface when the dough is stretched.*
9. **Rest the dough.** Allow the dough to rest for 5-10 minutes before forming into loaves. This gives the dough time to relax, and it is easier to shape the loaves. If making White bread, the dough should be fermented for about 1 hour. It is allowed to rise until double in bulk in an oiled bowl. The best temperature for fermentation is 78-82 F. Punch down the dough before shaping into loaves.
10. **Shaping the loaves.** After measuring the amount of dough needed for each loaf, take the dough and roll it out on a lightly sprayed or oiled counter into a rectangle, 7 1/2" x 10". Then roll the narrow end up, jelly-roll fashion, pinching the seam together. Place the dough into a sprayed pan and cover it with a damp towel.
11. **Let the loaves rise until double in bulk.**
12. **Baking the loaves.** Breads should be baked at a higher temperature (400 F) for the first 10 minutes. This sets the yeast cells and prevents the bread from rising higher. The oven temperature is then turned down to 350 F to finish the baking process. Make sure that there is a space between the loaves in the oven so that the heat can circulate evenly between the loaves.
13. **Cooling the bread.** When the bread comes out of the oven, it must come out of the pans within 5 minutes. Otherwise it will become soggy. Hot bread may be dashed quickly under running water. Steam will be created, leaving a soft crust. Brush with melted butter. Cool on a rack, then put away in clean plastic bread sacks.

Enjoy your bread!

The knife you use when you slice the bread is very important. The best knife is a long, sharp serrated knife.

If your bread is still hot when you slice it, your slices will need to be a little thicker than normal, because the cell walls of the bread are very fragile until the bread cools. Be gentle with the knife. Use a sawing action, going back and forth at least 7-8 times before reaching the bottom. Try to slice without pushing down too hard on the loaf.

Whole wheat bread will stay fresh for one day at room temperature, two to three days in a refrigerator, or up to three months in the freezer, if well wrapped.

Recipes: Whole Wheat Bread (7 loaves)

12-15 cups whole wheat flour

2 1/2 TB instant yeast

1/2 cup oil

2 TB salt

4 1/2 cups scalded milk

1/2 cup honey (double the honey when making cinnamon swirl bread)

3 eggs

1/4 cup dough enhancer

1/2 cup Vital Wheat gluten

Mill approximately 10-11 cups of wheat. As it is milling, combine warm milk, oil, honey and salt in mixing bowl. After liquids have cooled to a warm temperature, add 1 cup flour and mix. Add 6 more cups wheat flour, instant yeast, eggs, dough enhancer and wheat gluten. Mix together on low speed for 2-3 minutes. Continue adding flour as the machine mixes on low speed (5-6 cups at first, then 1/2 cup at a time) until the dough is the desired consistency. The dough should be pliable, but not too sticky or dry. Continue mixing on high speed until gluten is developed. (5 minutes with Bosch). Allow dough to rest for 5 minutes. Turn dough out onto lightly sprayed or oiled counter, knead slightly and divide into loaves. Let rise until double in size. Bake at 400 F for 10 minutes. Turn oven down to 350 and continue baking for 25-30 minutes.

Recipes: Whole Wheat Bread (2 loaves)

2 1/2 cups scalded milk

1/2 cup honey

1/4 cup butter or oil

1 TB salt

2 TB instant yeast

1 egg

2 TB dough enhancer

1/4 cup Vital Wheat gluten

4 1/2 cups whole wheat flour

2 1/4 cups white or whole wheat flour

Generously grease two loaf pans. In large bowl, combine scalded milk, honey, salt, and butter or oil. Cool slightly (temperature should be less than 105 F). To cooled mixture, add 3 cups whole wheat flour, yeast, egg, gluten, and dough enhancer. Blend at low speed until moistened. Beat 3 minutes at medium speed. Add remaining whole wheat flour and mix well. Add additional flour until dough pulls cleanly away from the bowl. Knead the dough for 5 minutes with electric mixer or by hand for 10-15 minutes. Shape into loaves. Let rise until double in size, about 45-60 minutes. Bake for 10 minutes at 400 F and an additional 20-25 minutes at 350 F. Remove from pans immediately.

*Mashed Potatoes in Bread?

Yes! It may seem unusual, but it is a great ingredient to add to bread. It is a good source for yeast and will act as a dough enhancer. Does the name "Spudnuts" ring a bell? The original spudnut doughnut contained good old spuds to make them light and fluffy. When added to wheat bread, mashed potatoes make a lighter, better textured bread. One-fourth cup of mashed potatoes per loaf may be added. If you don't have any eggs or dough enhancer on hand, mashed potatoes make a great substitute!

Sprouted Wheat Bread

Sprouted grain is easier to digest and contains more nutrients than un-sprouted grain. Some persons who are wheat sensitive or allergic to wheat can tolerate it in the sprouted form. Agricultural sprays may also create wheat sensitivities in some people. Cleaning the wheat in a chlorine bleach or hydrogen peroxide solution will remove residues from agricultural sprays.

It is easy to clean and sprout wheat before making bread. Sprouted wheat works very well in these bread recipes. The bread is softer, a little sweeter, and stores better (2-3 days at room temperature). Allow 3 days to complete the process.

Cleaning the Wheat

Place 8 cups wheat berries in a large, fine mesh colander. Fill kitchen sink full of water and add 1 tsp. Clorox bleach or hydrogen peroxide. (Do not use lemon scent or Clorox II).

Place colander of wheat in water, making sure all the wheat berries are covered. Soak for 10-20 minutes.

Remove wheat from cleansing solution and place in sink full of clean water to rinse. Soak for 10 minutes.

Remove wheat from rinse water. If you choose not to sprout the wheat, thoroughly dry before grinding into flour.

If you do choose to sprout the wheat, follow the directions below.

Sprouting the Wheat

Place 8 cups of clean wheat berries in a 16 cup container (1 gallon or two 1/2 gallon containers). Cover with water and soak for 24 hours until wheat doubles in bulk.

This 24 hour soak begins the sprouting process and will produce a wonderful bread at this point is you prefer to stop here and dehydrate the wheat.

<u>Dehydrating wheat:</u> Place wheat on dehydrator tray and dry at a low temperature (110 F—115 F) for 12 -16 hours before grinding into flour. Use sprouted grain flour instead of regular wheat flour in the included bread recipes

If you would like to include a more developed sprout in the bread, place the soaked wheat on a sprouting tray and sprout for one day to get sprouts of 1/16" to 1/8" long. Store sprouts in refrigerator 1-2 days until needed. These sprouts can also be dehydrated or milled into flour.

When using wheat sprouts in bread, use up to 1/3 wheat called for in recipe as sprouts. Combine wheat sprouts with liquid and pulverize in blender. Continue making bread as directed in recipe, using the remaining wheat as flour.

Sprouted wheat bread will rise faster and taste sweeter than un-sprouted wheat bread. Watch your bread carefully and adjust your recipe to achieve the taste and texture you are looking for.