

Simple Whole Wheat - Sourdough Starter

Sourdough has the power to leaven and flavor all kinds of whole grain bread. At the same time sourdough will make bread more nutritious, and more storage stable, than when made with bakers yeast, or baking powder. For example, the acidity allows the action of naturally occurring phytase in whole wheat, to break down phytic acid and release valuable minerals. Acidity will also discourage the growth of contaminating fungi and so preserves the bread longer, from turning moldy.

Simple whole wheat sourdough is a mixture of stone ground organic whole wheat flour with water, that has been allowed to ferment using only those microorganisms that are naturally present on the grain, and in the air. *Note that "organic unbleached flour" should not be used. Most brands are completely devoid of bran, germ and added vitamins that are essential nutrients for the sourdough microorganisms, and for people.*

The mixture becomes *sour*, or acidic, when lactic bacteria take over the fermentation. Specialized yeasts that are symbiotic with the lactic bacteria can also withstand the acidity. The sourdough microorganisms are primarily, compatible yeasts and lactic bacteria. Harmful microorganisms are excluded by the acidic environment of the sourdough.

Microorganisms naturally present in the air and in organic whole wheat flour, will grow readily in a mixture of the flour with water. If left at room temperature the growth will be sufficient for the microorganisms to grow until they crowd each other out from the remaining supply of food. With enough time, the mixture, which becomes a mature sourdough, usually becomes saturated with acid-producing lactic bacteria and compatible yeasts that can withstand the acidity. Once saturated in this way the mature sourdough can be refrigerated to preserve the microorganisms.

In order to obtain a fresh supply of these microorganisms, a small amount of mature sourdough is added to a new mixture of stone ground organic whole wheat flour and water. Stirring the sourdough brings air to the yeasts that need it. The rest time between stirring, when the oxygen supply is low, favors the growth of the lactic bacteria. After allowing enough time for the microorganisms to reproduce and saturate the flour and water medium, the sourdough can be stored refrigerated. Portions of this mature sourdough can then be used to make breads and pancakes for up to 4 weeks. Ideally the sourdough is stored only for 1-2 weeks before being refreshed again to increase the supply.

Fermentation is highly sensitive to temperature so that sourdough refreshment to a mature sourdough, may take just 24 hours in the heat of summer and yet it will take 3 days in winter. The general rule is that the sourdough fermentation will be 2 to 3 times faster if the temperature rises by 18°F (10°C). Of course this temperature connection applies both to the sourdough and to sourdough bread dough. The favorable temperature range to encourage the appropriate microorganisms is 68 – 77 °F (20 – 25 °C).

Making sourdough for the first time

Ingredients	Bakers per cent	Grams	Ounces	Cups & spoons
Stone ground whole wheat flour	100	100	4.00	1 cup
Water*	125	125	5.00	½ cup

*Water should be carbon filtered if antibacterial compounds are present.

[] Mix whole wheat flour and water in a bowl large enough to allow for expansion of the sourdough as it forms. Cover with a plate, and leave at room temperature preferably 68 – 77 °F (20 – 25 °C). Initial pH is greater than 5.

[] Stir the fermenting sourdough at least twice daily.

After 2 – 3 days the aroma should mellow and the initial bubbiness should subside. If testing with acidity test paper the pH should be 3.5 – 4.

On day 4 the gluten thins and there is a tendency for the solids to settle out and leave a watery upper layer. A thin layer of another yeast, smelling of bananas, may form on top of the watery layer, especially if the mixture is left undisturbed for 12 -24 hours. This can be stirred back into the mixture.

[] On approximately day 5, the sourdough can be used as a starter to make bread. Stir any separated water back into the sourdough, and in any case stir and mix well before using. Refresh the sourdough starter in order to increase the amount and to maintain it.

Refreshing sourdough

Ingredients	Bakers per cent	Grams	Ounces	Cups & spoons
Stone ground whole wheat flour	100	100	4.00	1 cup
Enzyme active malted wheat flour (optional)	1	1	0.04	¼ teaspoon
Water	125	125	5.00	½ cup (generous)
Salt (optional)	1	1	0.04	¼ teaspoon
Mature sourdough	10	10	0.40	1 teaspoon

[] Use a large enough bowl to allow for sourdough expansion. Add stone ground whole wheat flour. *Optionally mix in the enzyme active malt flour.*

[] Separately measure water. *Optionally add salt and dissolve it completely.* Add the mature sourdough and disperse evenly in the water.

[] Add the water mixture to the flour. Mix well until evenly incorporated. Cover with a plate. Leave to ferment at room temperature preferably 68 – 77 °F (20 – 25 °C).

[] Stir the fermenting sourdough at least twice daily. Notice the aroma and degree of bubbiness, which is usually greatest after 8 -12 hours. Allow the fermentation to continue until after stirring and waiting, very few new bubbles appear, the aroma has mellowed and the texture has thinned; this usually takes 24-48 hours. *If testing with acidity test paper the pH should be 3.5.*

[] After a further 12-24 hours, a watery layer separates on top and ideally acquires a film of a yeast overgrowth smelling of bananas. This is now mature sourdough, ready for use in bread or to be stored for later use.

[] Store mature sourdough, covered, at 40 °F (4 °C). *The sourdough is best stored such that it fills a narrow jar, and can be covered with a loosely fitting screw cap lid. In this way the risk of surface contamination is much reduced. Stir well before measuring out for a recipe.* Use within one week preferably, although the mature sourdough should remain useful for up to one month.

[] *Use the previous batch as the source of mature sourdough for refreshment. Regular weekly refreshment best maintains the leavening strength of the starter.*