

Sourdough

the fundamentals of sourdough baking at home



*a guide from
Cultures for Health*





a guide by Cultures for Health

SOURDOUGH

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INTRODUCTION TO SOURDOUGH

what to know about this fermented bread



Bread has been called the staff of life, but like many other food products on the market today, bread is not what it once was, nor what it still has the potential to be.

Real bread is made not from commercial yeast found in packets, but from a natural leavening called sourdough. Real bread is also easier on the tummy and the pocketbook than today's yeasted breads, making it not only nourishing but affordable.

Sourdough can be made with two simple ingredients (plus the proper techniques) and will improve the flavor, nutrition, and digestibility of your bread.



How Sourdough Works

The basis of all sourdough bread is a sourdough starter, which is a simple combination of water and flour. This mixture takes on yeasts, acids, and bacteria when in the presence of a consistent food supply, air, and warmth. For optimum rise in baking, a higher amount of yeasts than bacteria in the starter is beneficial.

Sourdough breads are produced when a sourdough starter is combined with flour and water to make dough. This sourdough starter contains lactobacilli bacteria that feed on the flour, producing gases that get trapped in the flour-water mixture and cause the bread to rise.

As the gases are produced so are acids. These acids produce the sour tang we all recognize in sourdough breads.

History

Sourdough bread was the yeasted bread made for thousands of years before commercial yeast came on the market.

Many historians speculate that the Egyptians were the first to discover that flour and water, if given enough time, oxygen, and warmth, could “come alive” to rise what might be a very dense simple dough.

It was then discovered that by keeping a bit of the dough for the next batch of bread, one could have a continuous supply of the bacteria and yeasts producing these lovely, risen loaves.

What is wonderful about sourdough starters is that each region of the world will have one containing very specific yeasts and bacteria (native to that area), which would in turn create various flavors and textures of bread only available in that region. The famous “San Francisco Sourdough” is just one example.



What Makes Sourdough Superior?

Breaks Down Gluten

The longer rising/soaking time necessary to raise sourdough breads allows for the breakdown of the proteins (gluten in wheat) into amino acids, making it easier to digest. This is why some people who have a gluten sensitivity can tolerate sourdough wheat breads.

More Nutritious

Because sourdough breads go through a fermentation process, many of the simple sugars present in the grain are eaten up in the process. This makes the bread easier on blood sugar levels. The fermentation process also makes the bread higher in nutrients, especially B vitamins.

Naturally Preserves the Bread

The lactic acid produced during the fermentation process creates a lovely tang in the bread and predigests the grain for you. The acetic acid helps the bread to store longer by inhibiting the growth of molds.

Neutralizes the Anti-Nutrients

Finally, the bacteria present in the sourdough help to activate phytase, an enzyme that breaks down phytic acid, an anti-nutrient found in all grains and seeds. This allows your body to better hold onto minerals, as phytic acid can bind with them and take them out of your body.

Sustainability

One of the best features of the sourdough process is that it allows you to make bread with the simplest of ingredients, ones that you can even produce yourself. Instead of having to buy a yeast packet for every loaf of bread, you can just add a plop of your homemade starter made from flour, water, and the bacteria and yeasts that surround you, and kiss the yeast packets good-bye.

The Basic Principles of Working with Sourdough

While maintaining a sourdough starter does require some effort, it really is only a small amount in comparison to the return that you will be getting in terms of taste, nutrition, and savings versus other leavening sources.



Time Commitment

If you are interested in baking bread at home, sourdough or not, then you understand that any (fairly small) time commitment involved in making homemade bread is worth it.

The hands-on time commitment for sourdough is really very little. There are two aspects to the sourdough time commitment: the feeding of the culture and the rising/baking of the bread.

The time commitment dedicated to feeding the culture is literally only minutes per day or even per week, if you are storing your starter in the refrigerator. The time commitment in baking bread is primarily taken up in the long rising period needed for the yeasts in the culture to produce the gas and therefore the rise of the bread.

Your overall time commitment in baking the bread will be 30 to 40 minutes of prep along with a hands-off rising time of 4 to 24 hours.

Working with Different Flours

When you receive your dried sourdough culture you should reactivate and get it up and running with the flour type indicated. So a rye flour starter should be activated with rye and a wheat sourdough starter with wheat.

If you would like to switch the flour you are using for your starter we recommend that you split your established starter in half, leave one in the refrigerator and feed with the original flour, and feed the other half with the new flour. This will leave you with a backup in case, for some reason, the new flour negatively affects the existing starter.

If you would like to mix and match your flours in baking this is perfectly acceptable. So for instance, if you wanted to use half rye flour and half wheat flour with your wheat starter that would be fine. Just be aware that your starter has been consistently fed with one flour so it is used to that flour as food. The starter, therefore, may act very differently in baking when a new flour is introduced. This is because different grains have different protein and carbohydrate profiles.

As a result, you may get a shorter or longer rise time, a stronger or milder flavor, or a different texture in the final baked loaf.

If you have only ever baked with wheat flour, please note that other grains have less or no gluten, which is the protein in wheat that creates the elasticity of bread that helps it to trap gases and rise. If you introduce a non-wheat flour into your baking you may find that your loaves don't rise as well or aren't quite as fluffy.

On the other hand, grains lower in gluten such as spelt and rye have a texture and flavor that is both unique and delicious, as well as being a bit easier to digest for those sensitive to gluten.

Equipment

A sourdough culture contains acids and other living organisms. Because of this all of the equipment that will come in contact with the starter should be non-reactive. Glass, wood, and plastic are great options.

The equipment necessary to care for your starter is simple: a vessel (jar or container), a wooden or plastic stirring utensil, and a breathable lid.

To get started with sourdough bread baking you will need:

- A large bowl to mix the dough
- A wooden or plastic mixing utensil to mix the bread
- Measuring cups and spoons
- A clean work surface to knead the bread, if necessary
- Baking pans or sheets for the oven
- A cooling rack

Measuring Ingredients



Bread baking is a bit of science and a bit of art rolled into one. There are exact recipes and formulas that you can use to get the same result every time. Or, if you are a more free-spirited baker, you may want to simply learn the technique and allow yourself to use whatever you have on hand.

In measuring ingredients it is advisable to start by being precise in order to learn the general science behind it. You can measure ingredients in volume (cups, tablespoons) or by weight (ounces, grams).

When measuring in volume, scoop the flour with your measuring cup and then level the flour with the back of a knife to be precise. You can do the same thing with measuring spoons.

Dough Basics

If you have never worked with bread dough then you are in for quite a treat. If you have been baking for a while you know the joy of getting your hands into the dough to create a beautiful finished loaf.

Mixing

When you begin your sourdough bread recipe you will first combine ingredients.

Often you will come across a recipe that calls for a range of flour: 2 to 2-1/2 cups for instance. Always start with the least amount of flour called for and slowly work your way up, gauging the texture of the dough as you go.

This will take into account the hydration level of your starter as well as the humidity in your area on that particular day.

Keep in mind that a moist dough is preferable to a dry dough. The dough should just come together in a ball that pulls away from the bowl, but it should also remain moist.

Kneading

Once you have your ball of dough you can begin the kneading process. Kneading is simply the act of working the dough until the gluten is developed enough to be elastic, which in turn traps the gases needed to make the bread rise.

You will need a clean, flat surface for kneading. In a pinch a large, wide bowl can work as well. You will also need to have some extra flour handy to prevent sticking.

Sprinkle a small amount of flour over your work surface to begin. Take your ball of dough and gently push it away from you using the palm of your hand. Now roll it over on top of itself and repeat.

Continue kneading your bread for 5 to 20 minutes, depending on your flour, until the dough feels elastic and stretchy.



Proofing

Proofing is simply giving the dough time and warmth in order to let the sourdough culture leaven your bread.

Many recipes will call for two proofs, one in a bowl and one in the pan that you will be baking in, but when working with sourdough (as opposed to baker's yeast), a second proofing is not required.

So once you have finished kneading your dough, shape it into a loaf for the size pan you will be using, place it in the pan and cover it with a damp cloth or paper towel, then place it in a warm (70° to 85°F) location to rise.

Baking

If your dough has proofed properly you should now have a lovely risen dough. You can now prepare it for baking.

First preheat your oven according to the recipe's directions. You can slash your loaf with a very sharp knife if you wish to create a bit more rise in the oven. Then simply place your bread in the oven and bake until the internal temperature has reached 210 °F.

Remove the bread from the pan and allow to cool completely (if you can wait that long) before cutting.



Recipe Ratios

The ratio of ingredients may vary slightly from recipe to recipe. Generally speaking, there is a formula that many bakers stick to when dealing with sourdough, but be advised that it deals in weights, not volumes.

Start with one part 100% hydration starter, meaning 8 ounces of starter is made up of 4 ounces of water and 4 ounces of flour. You then use add two parts by weight of water and three parts by weight of flour.

Most bread recipes also include salt. A good rule of thumb is to use 2% of the weight of the flour as the measurement for the salt.



GETTING STARTED

creating & caring for a starter



How to Obtain a Sourdough Starter

If you want to make traditional, healthy sourdough bread you're going to need a starter. You have a few options in obtaining one:

1. You can attempt to capture the wild yeasts and bacteria present in your area by creating your own sourdough starter.
2. You can purchase an established sourdough starter that already contains reliable yeasts and bacteria.
3. You can get a bit of established sourdough starter from a friend who is baking with sourdough.

How to Make Your Own Starter



If you're interested in creating your own sourdough starter you'll need some basic ingredients — flour and water — and some basic equipment and conditions.

The conditions necessary to make a sourdough starter include:

- A warm temperature between 65° and 85°F or thereabouts.
- A non-reactive vessel in which you make and store the starter (glass or plastic).
- A non-reactive stirring device to incorporate air.
- A breathable lid such as a clean towel or coffee filter.

- A space to ferment with no other cultured foods nearby.

Once you have these things figured out you can combine your flour (preferably freshly ground whole-grain) with slightly less water. So you could start with 3/4 cup flour and 1/2 cup warm water in a half gallon jar.

Stir vigorously with a non-reactive utensil to incorporate air, and cover with a breathable lid. Allow to sit in a warm place for 12 to 24 hours. Feeding every 12 hours will increase the rate at which your sourdough starter is multiplying its organisms; feeding every 24 hours will take a bit longer, but may be more sustainable depending on your time commitment.

At the 12 or 24 hour mark hopefully you will begin to see some bubbles, indicating that organisms are present. Repeat the feeding with 1/2 cup warm water and 3/4 cup flour. Stir vigorously, cover, and wait another 12 to 24 hours.

At this point, you should start removing half of the starter before every feeding and discarding it into the compost so that the starter you do have can multiply in organisms without overflowing your jar.

After about 5 to 7 days your sourdough starter should have enough yeasts and bacteria to be useful in baking.

The Benefits of Obtaining an Established Starter

You may go through the above steps in making your own starter only to find that it smells or tastes off or that the bread and other baked goods it produces isn't all that pleasant in flavor.

That is where an established culture comes in.

An established culture is easier in that the process of getting it started is faster and simpler. It is also more reliable in that it already contains active yeasts that have been perpetuated over a long period of time and therefore are stable, active, and resilient.

And finally, an established culture, because of its established bacteria and yeast, can guarantee a more pleasantly flavored bread product.

Sourdough Starter Instructions



Before You Begin

- Your sourdough starter has been shipped in a dehydrated state. The starter is shelf-stable and can be used any time in the next few months. Store the starter in a cool dry place.
- Whenever possible, use filtered non-chlorinated water when feeding your sourdough starter.
- Use the same kind of flour as the starter was grown in (white, whole wheat, rye, etc.) to activate this starter. Once your starter has been fully activated, you can feed the starter and bake with a different variety of flour if desired.
- If you are culturing multiple products (e.g., different varieties of yogurt, buttermilk, kefir, sourdough, kombucha, etc.) or baking with commercial yeast, be sure to keep a distance of at least several feet between cultures so they don't cross-contaminate each other. Over time, cross-contamination can weaken the cultures.

Activating the Sourdough Starter

- Place the contents of the package into a clean quart (or larger) wide-mouth canning jar or similar container.

- Add 1/4 cup tepid (room temperature) water and mix well. Add 1/4 cup flour and stir vigorously. Be sure to incorporate a significant amount of air into the mixture.



- Cover loosely. (A towel secured with a rubber band, or a plastic lid just set on top but not secured, will work well.) Place in a warm area (70° to 85°F) for approximately 12 to 18 hours. The warmer the spot, the more quickly the starter will activate. An oven with just the pilot light or oven light turned on can work well as will a high shelf or a food dehydrator with a low temperature setting. Be sure to verify that the spot where your sourdough culture is sitting is within the 70° to 85°F temperature range. Temperatures outside that range can be problematic for activating the culture and can even damage or kill the culture.
- Mix in 1/2 cup water and scant 1/2 cup flour. Be sure to incorporate a significant amount of air into the mixture. Cover and return to the warm spot for 12 hours. Be sure to use a sufficiently sized container and place a cloth or paper towel under the container as active sourdough starter may bubble over.
- Discard all but 1/2 cup of the flour and water mixture. (See our [sourdough pancake recipe](#) for a way to use extra discarded sourdough starter). Mix in 1/2 cup water and a little less than 1 cup flour. Repeat this process every 12 hours until the mixture becomes light and bubbly. If the mixture is kept quite warm, this process may be concluded within the first several days. For cooler spots, it may take several more days to complete the process. It is common for sourdough starter to take 3 to 7 days to activate.
- Once the starter is bubbling reliably within several hours of being fed, feed the starter for two more cycles then cover loosely with a lid and place it in the refrigerator until you are ready to

bake with it. The lid may be tightened once the mixture becomes dormant and minimal carbon dioxide is being produced.

Making Fresh Starter



- "Fresh sourdough starter" is a term often used in recipes to refer to recently fed, active sourdough starter.
- Refrigeration places the sourdough starter in a state of hibernation which allows a starter to go at least a week without being fed, but also renders the yeast temporarily ineffective as a leavening agent. To bring the starter out of cold-induced hibernation, the sourdough starter should be fed at least three times to fully activate the yeast prior to using the starter for a baking project.
- Start the fresh starter process by removing 1/4 cup of sourdough starter from the refrigerator. (If a liquid layer has developed on top of your starter, pour off the liquid layer first.)
 - *If using a kitchen scale:* Add flour and water in amounts equal (by weight) to the amount of starter. For example, for 50 grams of sourdough starter, mix in 50 grams of flour and 50 grams of water. The scale method is preferred due to significant differences in flour density.
 - *If using measuring cups:* Use 1 part sourdough starter to 1 part water to a little less than 2 parts flour. For example, if you are starting with 1/4 cup of starter from the refrigerator, mix in 1/4 cup water and a scant 1/2 cup flour.
- Cover and allow the mixture to sit for 4 to 12 hours until it has “proofed” (become active). The amount of time will depend primarily on the nature of the specific sourdough starter and

room temperature. Sourdough that has proofed becomes light and bubbly. The gas created often causes the sourdough starter to expand in size so be sure to use a sufficiently sized jar and set the jar on a paper towel to protect the surrounding surfaces in case the starter bubbles over. If the sourdough does not become bubbly within 12 hours, proceed with the next feeding.

- Repeat this process at least two more times. For each feeding use equal amounts of starter, flour, and water by weight, or use the measuring cup ratios above. It is important to have some idea how much sourdough starter you will require for your baking project (e.g. 3 to 4 cups to bake bread, etc.) so you don't make too much starter during this feeding process. If you make too much sourdough starter during this process, prior to the next feeding some starter can be discarded or set aside to make [Sourdough Pancakes](#) or [Sourdough Rosemary Crackers](#).
- If at any point during this process a liquid layer develops on the sourdough starter, pour off the liquid layer prior to the next feeding. The liquid layer is generally a sign the starter needs to be fed more often so feedings should be moved closer together (i.e., feed the starter every 8 hours instead of 12 hours, etc.).
- Once the starter has been fed for at least three cycles and is bubbling reliably within several hours of being fed, measure out the portion needed for the recipe.
- Be sure to add some of the extra fresh starter back to your master sourdough starter in the refrigerator. This process feeds the sourdough starter for the week (see below).

Feeding the Sourdough Starter

It is important to maintain your sourdough starter even if it is being stored away in the refrigerator. If you bake with your sourdough starter during the week, part of that process will include feeding the starter. During weeks when you won't be baking with your sourdough culture, we do recommend feeding the culture to maintain its viability.

To feed your sourdough culture:

- Remove the starter from the refrigerator. If a layer of liquid has developed on top of the starter culture, simply pour it off.

- Discard all but about 1/4 cup of starter. Add equal amounts (by weight) of flour and water. (If using measuring cups, use 1/4 cup water and a scant 1/2 cup flour.) Mix vigorously to incorporate air.
- Cover loosely and allow the starter to proof at room temperature for several hours. Return the starter to the refrigerator at the conclusion of the proofing process.



How to Keep Your Sourdough Starter Healthy



Keeping a sourdough starter is a little like caring for a pet or a child. They need the right conditions to thrive, you have to feed them daily (or weekly if refrigerated), and they die on you if you neglect them.

The Right Conditions for Sourdough

Remember that sourdough needs a few things to thrive:

- Warm temperatures between 65° and 85°F,
- A space of several feet between the sourdough culture and any other culture (yogurt, kombucha, kefir, etc.),
- A non-reactive (glass or plastic) vessel and stirring spoon for storing and feeding,
- A consistent food supply.

Feeding Your Starter

A note on ingredients: Non-chlorinated water is best for a sourdough culture as chlorine can interfere with the organisms in the starter. A freshly milled flour of the variety that your culture specifies is preferable.

A note on the flour-to-water ratio for feedings: When you feed your sourdough starter, feed it approximately equal weights of flour and water. You can measure the flour and water by weight with

a kitchen scale or you can figure that for every cup of flour you will need about 1/2 cup of water. The measurement ratio can vary depending on how heavy or dense the flour is.

How frequently you feed your starter is dependent on how often you wish to bake with it. If you think you'll be using your starter every couple of days or even more frequently then you should feed it every day. If you will only be baking with it once a week then you may refrigerate it and feed and refresh it before baking.

Hydration Levels

You may come across the term “hydration level” when reading about sourdough and its starter. A *hydration level, in the simplest of terms, just refers to the level of liquid in the sourdough starter as compared to the level of flour.*



You will have a 100% hydration level if you are creating a starter with equal weights of flour to water. So you can assume that for every 8 ounces of starter, 4 ounces of it is considered liquid and 4 ounces is considered flour.

For the most part you shouldn't have to worry about the percentages of hydration in a recipe if you stick with the 100% hydration starter.

For someone who is interested in the intricacies of baking and converting family recipes to sourdough recipes this may be useful as you can feed your starter up and down in hydration levels in order to

achieve the desired baking effect. Additionally, understanding hydration levels may help you convert any recipe to use sourdough starter instead of commercial leavening.

Choosing a Water Source



Many fermented foods make use of water in the culturing process. The water can do a variety of important things:

- Water is a carrier for trace minerals that are sometimes important in culturing.
- Sometimes moisture is necessary to the culturing process, and the moisture is provided by water.
- Bacteria, swimming in water, are able to contact the material being fermented.
- Water with other ingredients (sugar, tea) can become the liquid that is fermented to make the final product.
- The material being fermented is protected from oxygen by staying underwater, which prevents the development of pathogenic bacteria or molds.

No matter what you are culturing, it is vitally important that the water you use be clean and free of pathogens or toxins. Beyond that, certain types of cultures have different requirements for water that you should be aware of to get the best results.

Municipal water quality varies around the country, and so does the quality of spring water and well water. Most cultures are pretty forgiving of water quality as long as the water is drinkable.

The water you use for culturing will most likely come from one of four sources:

Well Water. Water that comes from your own well, or a well you share with some neighbors. Some municipalities also get their water from wells.

If your water is from a municipal well, there is chlorine, and possibly fluoride, in the water, as well as any other treatment chemicals the utility chooses to add. Private wells are required to be tested for microbial contamination at the time the well is installed, but not thereafter. Well owners should test their water annually for microbial contamination and chemical contamination from nitrates/nitrites, arsenic, petroleum byproducts, radon, or pesticides.

Well water is typically high in minerals, which is good for water kefir, not so good for kombucha, and really hard on your laundry. If the water is particularly acid (pH 7.0 or lower), it can cause leaching of metals from plumbing. If well water is discolored or has an odor, there may be an overly high mineral content from ground contamination or from decayed vegetation.

Spring Water. Similar to well water, spring water comes out of the ground and is used close to the source, or bottled for commercial sale. The main difference between spring water and well water is that spring water is collected at the surface of the earth, while well water is collected considerably below the surface. A natural spring is the result of water in an underground source seeping through the ground or rock and bubbling out through the surface.

Spring water is also typically high in minerals.

As a result of having been filtered through earth or rock, spring water is usually considered relatively free of contaminants. However, if the ground it's being filtered through is contaminated, the water itself can be contaminated too. It can also become contaminated in its journey from the spring, through plumbing, to your faucet. Most people do not have springs as a local source of drinking water.

Tap Water. Water that comes from a municipal water source. This could be glacier water, well water, river water, or water collected in a variety of ways.

Tap water may be hard (contains minerals including calcium and magnesium), or soft (relatively free of minerals). Since hard water leaves deposits on tile and fixtures, and doesn't do a great job with laundry, many home owners choose to run their water through a water softener that adds salts to remove the "hard" minerals. To find out what is in your tap water, you can check with your water utility and they can provide you with a water quality report.

Tap water is inexpensive and plentiful, and is almost always of a quality good enough to drink and cook with. It can usually be used “as is” for many culturing projects.

Water that is too “hard” can be a problem for some cultures, while water that is too “soft” can require remineralization for some other cultures. Tap water also usually contains chlorine, chloramines, or fluoride that must be removed for some cultures to work well.

Bottled Water. You can buy water in plastic bottles almost anywhere these days. Check the labels: it can be spring water bottled at the source, or water collected from rivers or streams, or even municipal tap water.

Bottled water may have fluoride added to it.

Distilled water is a type of bottled water that has been completely purified and contains no minerals or chemicals of any sort. Water that is sold in fountain machines at supermarkets is usually distilled or purified in other ways, and is free of chlorine, fluoride, minerals, or bacterial contaminants.

Common Contaminants



Water that is not distilled is rarely pure. Aside from the natural minerals and salts you may find in even the cleanest sources, there are usually chemicals of some sort in your water.

- **Chlorine** is added to most municipal water sources to keep pathogenic (bad) bacteria from reaching the consumer. This is generally a good thing, since the water usually passes through a variety of reservoirs, pipes, and other contraptions before it reaches your faucet. Water can contain all sorts of bacteria or organisms that are easily killed by chlorine. Unfortunately, that chlorine can also kill the probiotics that you are trying to work with. Chlorine is reasonably safe to ingest in the quantities present in drinking water, although some people are sensitive to it.
- **Chloramines** are a compound of chlorine and ammonia. They are more stable in water than chlorine, and are used by many municipalities to ensure the safety of drinking water. Water treated with chloramines has little taste or smell, so this is an attractive disinfectant process for public drinking water. Like chlorine, chloramines are considered safe to ingest in drinking-water quantities, although some people are sensitive to them. Also like chlorine, chloramines can be toxic to some probiotics.
- **Fluoride** gets into water in two ways. It can be naturally occurring, as a trace mineral from the water source, or it can be added by the water utility. Fluoride occurs naturally in fresh water at around .01 to .3 parts per million. The chemical from which fluoride is derived is fluorine, a very common element that bonds easily with practically anything. It's called fluoride in its

bonded form. Sodium fluoride, hexafluorosilicic acid, or hexafluorosilicate are generally used to add fluoride to drinking water, at a concentration of about 1 part per million. There is a tremendous amount of controversy over whether this practice is helpful or harmful. Many municipal water utilities add fluoride to the water. Some do not. Naturally occurring fluoride is rarely a problem in culturing. Added fluoride is generally toxic to young plants, and can also be toxic to certain probiotics.

- **Chemical Waste** can appear in drinking water from a variety of sources. Any chemical waste that is disposed of in drains or on the ground ultimately finds its way into the municipal water supply. Some of it is removed through standard waste treatment, and some shows up in public drinking water. Even well water and spring water can be contaminated if the chemicals are leached into the soil near the water sources. Common chemical contaminants include fertilizers, animal waste, detergents, industrial solvents, pesticides and herbicides, radon, heavy metals, prescription medication, and even decayed plant matter.

Treatment Methods

If you are getting your water from a faucet, you may or may not need to treat it before using it for culturing. Some probiotics are very sensitive to the type of water you're using, while other probiotics are very resilient and can use almost any sort of water. However, if your water is not of drinking quality, you will definitely need to treat it before using it for culturing.

- **Aeration** is a suitable treatment method if all you want to do is eliminate chlorine from the water. Chlorine is very unstable in water, and if you boil the water or put it in a blender for about 20 minutes, the chlorine will percolate out. Or, you can leave water to stand for 24 hours to accomplish the same thing. Aeration will not remove chloramines.
- **Boiling** will take care of most common pathogens that might get into drinking water supplies. It does not eliminate fluoride or other heavy metals or chemicals.
- **Simple Charcoal Filtration** is what you get with a standard countertop or faucet filter system. Charcoal is made of carbon, which bonds with organic materials to remove them from the water it is filtering. Activated charcoal is charcoal that has been processed to open up many tiny pores in the material making more surface area available. Filtering water through

activated charcoal is one of the easiest and least expensive ways to remove common pathogens such as bacteria, chlorine, chloramines, etc. Charcoal filtration does not eliminate fluoride.

- **Enhanced Filtration** can be achieved with some types of whole-house filters, or more expensive faucet filters. It usually includes basic activated-charcoal filtration, as well as some chemical or barrier filtration. Enhanced filters will remove some particles that activated charcoal doesn't trap, such as sediment, calcium, etc. Some enhanced filtration systems are designed to remove fluoride as well, but may require more frequent filter changes due to trapped fluoride.



- **Reverse Osmosis** requires an RO system that may fit under your sink, or may require a separate installation. Reverse osmosis is basically a process of forcing water through a membrane, which removes all particles that are larger than water molecules, but allows the passage of tinier particles. RO systems usually include pre-filters that remove things like chlorine and bacteria from the water before it passes through the RO membrane. RO systems remove most minerals from the water, and will remove most fluoride.
- **Structured Water / pH-Balanced Water / Ionized Water.** Water that has been treated to alkalize it or to change its structure is not suitable for culturing. Culturing involves a precise interaction of bacteria and the food being cultured. If water is part of that culturing process, the natural structure and balance of the water should not be altered. If your water treatment unit has a setting for "clean water" that does not change the pH and does not alter the water structure, but merely filters out contaminants, then the water can be used for culturing.

What Kind of Water Do You Need?

Most cultures, such as sourdough, cheese, and fermented vegetables, are pretty resilient, and will safely use any water that is suitable for drinking. The water can be rich in minerals, or completely pure. Many people prefer to use water that is free of chlorine and fluoride, and there is no harm in removing those things from the water before you culture.

How to Switch Your Sourdough to a New Type of Flour



Sourdough comes in many forms. You can make a white-flour sandwich bread, a whole-wheat peasant loaf, a rustic spelt boule, or a dense rye. All of these are delicious and serve their own purposes.

If you want to branch out and try these different grains then you will most likely want to convert some of your sourdough starter to the type of flour you'll be baking with. It is fairly easy to convert your starter to whichever gluten-containing flour type you would like: white flour, whole wheat, spelt, or rye.

Switching to a gluten-free flour is a bit trickier, as it tends to require more feedings to become vigorous and maintain its efficacy in baking.

How to Switch to a New Flour

If you are interested in branching out into the world of various flours, then try these tips:

- If you are starting with a dried sourdough starter always revive it with the flour type indicated. So if it is a whole wheat sourdough, use whole wheat. If it is rye, use rye flour and so on.
- Do not attempt to switch flours until your sourdough starter has been fed for at least a week and is healthy and happy; i.e., bubbling and growing.
- When you are ready, take the healthy starter and divide it in two. Place the first half safely in the refrigerator as a backup in case your starter does not acclimate well to the new flour. This

backup should be fed with its regular flour to maintain its robustness until you are ready to split it and experiment with another flour.

- The second half can now be fed with the new flour. Within a few feedings your starter should be converted to the new flour and if it is healthy you can go ahead and bake with it.

Troubleshooting a New Flour

Not all flours work alike in sourdough. Because of this your starter may go through an adjustment period in which it is not as vigorous and may not perform as well as your original starter.

Whole grains, especially when freshly milled, tend to contain more organisms for the yeasts and bacteria to feed off of. So if you are switching from a whole grain flour to white flour you might see a decline in the health of your starter.

However, flour that has just been ground can be a little "raw" for the starter to utilize. Letting freshly ground flour age for a week or so can let it develop more of the healthy organisms the sourdough starter can utilize.

Rye, in particular, is very well suited to be food for sourdough. So if you are switching a rye starter to a new flour you might notice a change in the health of the starter.

If, after you have given your starter time to adjust, the sourdough starter appears to not be as vigorous as it was with the old flour, try feeding it a blend of the new flour and the old flour for a while to give it a boost.

Also, remember that you have the backup starter in the refrigerator. If all else fails you can discard a less-than-stellar new sourdough starter and either repeat the flour switch as recommended above or try a different flour. Just make sure you always split your starter to maintain a backup.

How to Take a Break: Proper Sourdough Storage

In reading about how to feed and care for a sourdough starter you might be thinking it is a twice-daily commitment for life. Rest assured that is far from the truth!

At one point or another you may need a break from feeding your sourdough culture. Perhaps you are taking the summer off bread-baking so as to not heat up the house. Perhaps you are moving and won't have the time. Perhaps you have a new baby and bread-baking is the last thing on your mind.

Whatever the case may be, there are options for short- and long-term storage of the sourdough culture. This can be done easily and your sourdough starter, if treated properly, should come back at least as strong as when you first started it.

Short-term Preservation

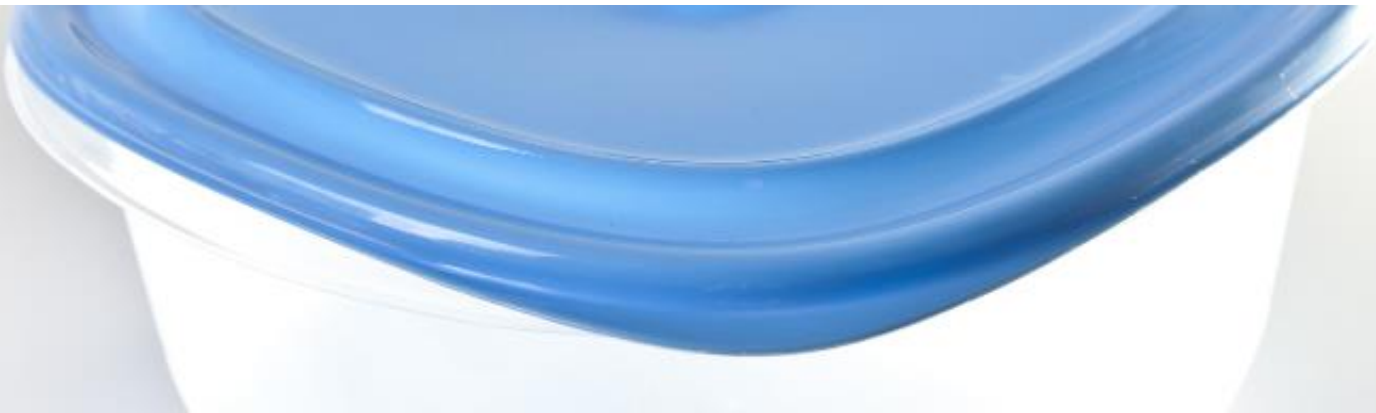


Perhaps you would just like to store your starter in the refrigerator for weeks or months at a time without using it for baking. It can be done, but there are a few things to keep in mind:

- Be sure that your starter is robust and at least 30 days old before you attempt longer refrigeration storage. The starter has to be vigorous to begin with in order to be vigorous after refrigeration.

- Gluten-free sourdough starters will not store as well as their gluten-containing counterparts. If you are storing a gluten-free starter, you might see whether a friend can feed your starter every few days if you are unable to.
- Lower the hydration level of your starter to around 65%. You can do this gradually by decreasing the amount of water that you feed the starter until for every ounce of flour in the starter you have .65 ounces of water. The low moisture content creates a more conducive storing state for the live organisms in your sourdough.
- Keep in mind that your starter will most likely double in volume in your refrigerator over time. So be sure not to overfill the container you are storing your sourdough in and make sure you don't create an airtight environment for the starter if you are using a glass jar with an airtight lid. The gases could build up enough in the jar to shatter it.
- You will still need to feed the starter if you plan to keep it in the refrigerator for more than a couple of months. Feeding and reviving the starter every 6 to 8 weeks is a good idea, and you can create some delicious loaves of bread every now and then if you still wish.
- When you wish to work with your starter again, plan on at least one extra feeding cycle to bring the sourdough out of hibernation.

Long-term Preservation



Perhaps you will be spending months or years away from bread baking. Perhaps you want to send a friend some of your starter but they live across the country. Or perhaps you have a wonderful starter and you'd hate to lose it so you would like a little insurance.

For long-term storage, you can dry the fully active sourdough culture for later use. This process is simple:

- Spread a bit of the fully active sourdough culture on a piece of parchment paper, a plate, or other clean flat surface.
- Once fully dried the starter should separate from the surface and can be removed.
- Crush or grind the now-dried sheet of sourdough.
- Store in an airtight container in a cool dry place. You could even store it in the freezer for extra insurance.

This dried starter, if kept in the proper conditions, should keep for years. See the [directions for reviving a dried starter](#) when you are ready to put it back to use.

Plan A: Keep an excellent sourdough starter going

Plan B: Have some stored sourdough starter as a backup



A close-up photograph of a person's hands, covered in flour, kneading a ball of dough on a wooden surface. The person is wearing a white apron over a dark shirt. The background is dark, and the lighting is focused on the hands and the dough. The text "BAKING WITH SOURDOUGH" is overlaid in red, and "start making sourdough today" is overlaid in white below it. A vertical dotted line is on the right side of the text.

BAKING WITH SOURDOUGH
start making sourdough today

Short vs. Long Fermentation in Sourdough Baking

The fermentation of bread has been going on since the baking of bread began. Often, when speaking of sourdough, terms such as *soak* and *rise* are used. These are both stages in the fermentation process that occurs when the starter is added to fresh flour and water to make dough.

The history of bread-making cannot be told without discussing the part that fermentation has in the process. Most likely some of the first loaves ever baked were near-accidents, in which a cook discovered that some flatbread dough left out suddenly came alive and began to rise.



And the wonderful world of sourdough was discovered.

The history of bread-making eventually took a turn towards faster, quicker, easier with the introduction of commercial yeast. Large-scale bread-making (and even home baking) soon went from an artisan process involving a little bit of hands-on time, a lot of love, and a bit of waiting, to a quick series of kneading and just a couple of hours of rising with no fermentation.

Making a yeast-risen sourdough loaf will automatically involve a long fermentation. Recipes for sourdough quick breads often involve sourdough just for flavor and other leavening agents such as baking powder and baking soda for a rise.

Neither of these is necessarily good or bad, but there are some benefits to a long fermentation even with a quick bread that has baking powder or soda added. Furthermore, long fermentation is the

traditional method of sourdough bread-baking, as a long rising session is necessary to achieve the lift desired in yeast breads.

Benefits

A long fermentation gives the sourdough time to work on the bran of the grain, breaking it down to make it more digestible, and neutralizing the phytic acid that can be difficult to metabolize.

A long fermentation imparts a depth of flavor that cannot be found with just a small addition of sourdough to a bread that uses baking soda for leavening. The 7- to 12-hour fermentation imparts flavor nuances that come only through time.



Benefits Package

A long fermentation removes the need for outside leavening agents. Simple breads can be made with an ingredient list that includes only flour, water, starter, and salt.

A long fermentation gives you wiggle room in your bread baking. It might not appear that way at first, because of the waiting involved. It is because of that long fermentation, however, that you can spend less time working your dough and more time letting the sourdough do the work for you. Because the fermentation helps break down the bran, it also allows the gluten to develop a better web. This web will then trap the gases produced during the rise time, giving you a fluffy loaf with very little kneading. The no-knead sourdough bread can be made simply by mixing the dough, allowing it to proof, and baking at a high temperature. As you can see, there is very little hands-on time required.

How-To

Using additional leavening agents for soured “quick” breads does allow you to have a sourdough-flavored quick bread while not having to wait for the fermentation period. Those additional leavening agents also add extra lift to the baked product and baking soda can help neutralize the tang of fermented sourdough bread.

So, those leavening agents can be helpful. They can also be used in conjunction with a long-fermented sourdough with terrific results. But you cannot achieve the digestive, flavor, and texture benefits through skipping the fermentation process and using the added leavening.

For a long-fermented quick bread such as biscuits, pancakes, muffins, and loaf breads: Combine the flour, starter, and any additional liquid such as milk or buttermilk. Mix just to combine and cover with a plate or wrap and allow to ferment for 7 to 12 hours in a warm place. Once the dough has fermented, stir in other ingredients such as eggs, baking powder, baking soda, salt, fat, and seasonings. Bake as directed.

Note that there is no need for additional commercial yeast if a yeast-risen sourdough bread is desired. Commercial yeast is only used in addition to sourdough in the event that someone desires a short fermentation time. Allowing a long fermentation also gives the yeast time to proliferate in the dough and produce a risen bread.

So while you can make sourdough breads with a short fermentation you will not achieve an authentic sourdough flavor. The shorter fermentation also doesn't take advantage of the natural bacteria and yeasts that, if given the time, will make your bread more tender and risen to perfection.

Artisan Loaves from Your Kitchen Oven



There's no doubt that a wood-fired brick oven produces the crispiest crusts on artisan loaves, but not many people have a brick oven in their back yard. There are some ways to achieve similarly crispy crusts by simulating a brick oven in your kitchen, though. A couple of inexpensive baking stones are a very worthwhile investment if you long for that toothsome crunch from your free-formed loaves and pizza.

Be sure to place your baking stones in a cold oven, one on the lowest rack and another on the top rack. If you place cold stones in a hot oven you risk cracking the stones. You will be placing the loaves or pizza only on the stone on the lowest rack. Preheat the oven, with the baking stones inside, to 500°F. Let the stones heat up for at least 30 minutes. If the stones are fairly thin (less than 1/2 inch), 30 minutes is long enough for them to get hot, but if your stones are thicker (3/4 inch or more), you may need to allow 45 minutes to an hour for them to get thoroughly hot. Lower the oven temperature to 425°F just before placing your loaves on the stone. If you are going to be cooking a pizza directly on the stone, leave the oven at 500°F.

Free-formed loaves achieve better “oven-spring” if the loaves are somewhat cool (around 50° to 55°F) when placing them on a hot stone. It helps to have a bread or pizza peel (a large paddle with a handle like the ones used in pizza restaurants) for transferring loaves in and out of the oven. Sprinkle the peel with cornmeal, brown rice flour, or semolina flour before placing your artisan loaf on it. Approximate where you want your loaf placed and then, using a quick “jerk” motion, deposit the loaf on the stone.

It may take a little practice to get the loaf to land exactly where you intended. Don't try to reposition the loaf once it is on the stone until the bottom crust is solid enough to slide easily.

Have a clean spray bottle filled with hot water near the oven. As soon as your loaves are placed on the hot baking stone, liberally mist the loaves and walls of the oven and quickly close the oven door. Repeat the misting after 5 to 10 minutes. The steam produced will help produce the crisp crust. Most loaves will require about 30 to 45 minutes of bake time. If your loaves are getting too dark, you can shield them with foil, but one of the desirable characteristics of artisan loaves is a dark, almost burned crust.

Try not to open the oven unnecessarily while the loaves are baking, since steam escapes every time the door is opened and it's desirable to keep as much steam as possible in the oven. Some people place a shallow pan of hot water on the very bottom of the oven to help with steam production, but generally just a couple of liberal mistings is sufficient.

Use the peel to remove loaves to a cooling rack when the crust is crispy and the loaves sound hollow when thumped on the bottom. If in doubt, insert a thin-probed cooking thermometer into the loaf. It should register around 200°F. If your loaves cooked in less than 30 minutes you may not achieve the thick chewy crust you desire. If you take them out of the oven before they have cooked to the proper internal temperature there will be enough moisture left in the crumb to soften the crust as it cools.

With just a little practice and a small investment in baking stones you can produce artisan loaves that rival those from brick-oven bakeries. And as for pizza, you'll never to call out for pizza delivery again!

Troubleshooting Free-Formed Sourdough Loaves

Breads are not always baked in a loaf pan. They can either be shaped in a basket and then baked directly on a baking stone, or shaped on baking sheets. These are some of the most common problems for these free-formed loaves.



Loaves bulge and split at the bottom edges or sides of loaves.

The loaves did not rise long enough. Let the loaves nearly double in size before baking. Also, be sure to make a few slashes on the top of the loaves, so gases created during baking have a controlled place to escape.

Loaves puff up initially in oven, but fall by the time the bread is baked.

Most likely the loaves rose too long, especially if the texture of the bread is coarse. When dough over-rises, it becomes fragile and loses its ability to maintain a strong internal structure. If you suspect dough has risen too long, simply reshape the loaves and let them rise again. This rise will be much faster than the first rise.

Loaves do not puff up well during baking. Loaves are somewhat flat.

There are several possibilities here.

- Dough could have been too warm when putting in the oven. Do not proof free-formed loaves in a warm oven or other very warm location. You'll actually get better "oven-spring" if the internal temperature of the dough is closer to 50°F when putting into a hot oven.
- Dough was too wet. If dough hydration is too high the dough will be too slack to hold its shape. Next time try adding a little more flour to the dough, or a little less liquid.
- Bread was baked at too low a temperature. Free-formed breads bake best around 400°F. Be sure the oven is at that temperature when you put loaves in.
- Dough was handled too roughly in transferring to the oven. Try shaping bread on a piece of parchment and then sliding loaf, parchment and all, onto baking stone.

Texture of bread is dry.

Not enough hydration. Try using less flour next time. Also, do not over-bake. Use a thermometer to make sure bread is between 190° and 205°F. Bread will lose too much liquid through evaporation if baked too long.

Crust seems fine when removed from the oven, but gets soft when it cools.

Not baked long enough. Bread emits steam as it bakes and even after it comes out of the oven. If the bread is under-baked, excessive steam will be released from the moisture remaining in the dough, creating a softer crust. Next time, bake the bread a little longer. And, be sure to use a thermometer to check the temperature of the bread to determine whether it is done.



Loaves spread out too much while rising; don't hold their shape.

Free-formed loaves need to be made from fairly sturdy dough to hold their shape. If your dough is on the soft side, let it rise in a basket (there are some inexpensive baskets available at restaurant supply stores) or use the ring from a spring-form pan to hold the dough's shape while rising. If you place the dough on parchment paper first, you can transfer the loaf, parchment and all, directly to your hot baking stone.

Be sure dough is sufficiently kneaded to develop the gluten. Under-kneaded dough can be too slack to hold its shape well.

Crust is not crisp enough.

Bread may be under-baked or baked at too low a temperature.

Add some steam to the oven while bread is baking. Spray the walls of the oven (be careful not to spray the light bulb) with a fine mist of water immediately before placing the loaf in, and spray again several times during the first 15 minutes of baking. A crispy crust is the result of high humidity. Commercial bakeries often have steam emitters in their ovens.

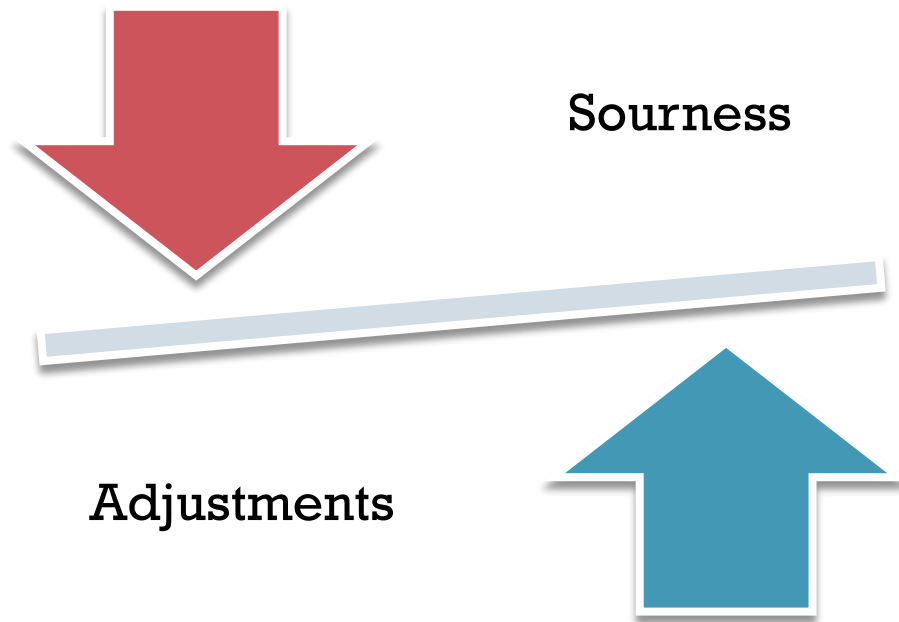
Bread is doughy in the center.

Bread is under-baked. Insert a thermometer all the way into the center of the loaf to check for doneness. Bake for a longer time and/or at a higher temperature.

It's also possible that there was too much liquid in the dough. Try adding more flour next time.

Tips for Manipulating the Sourness of Your Sourdough

Some people love the acidic flavor of sourdough bread and can't get a loaf that's tangy enough. Others prefer their sourdough very mild. And some fall somewhere in between.



Fortunately you can manipulate your starter to achieve your desired level of tang.

For a More Sour Sourdough

There are two main acids produced in a sourdough culture: lactic acid and acetic acid. Acetic acid, or vinegar, is the acid that gives sourdough much of its tang. Giving acetic acid-producing organisms optimal conditions to thrive and multiply will yield a finished product with more tang. Here are some tips to help achieve this:

- Maintain your starter at a lower hydration level. Lactic acid-producing organisms seem to thrive in a wet environment while acetic acid is produced more abundantly in a drier environment.
- Use whole-grain flours, which the acid-producing bacteria love.
- Keep the hooch. The liquid that can accumulate at the top of your starter, known as the hooch, can aid in producing a more acidic sourdough.

- Try to achieve a longer, slower rise. This may mean you'll need to
 - Create a cooler rather than a warmer environment. Consider letting the dough rise in a cool basement or other cool area of the house.
 - De-gas (punch down) your dough at least once, if not twice, before the final shaping of the loaf.
 - Let the shaped dough (in pans or baskets) do the final rise for at least four hours or overnight in the refrigerator. Take the dough out of the refrigerator and let it sit at room temperature for about 30 minutes to an hour before baking. Although many experts actually recommend that your last rise be a quick one done in a warmer environment, you will have better “oven-spring” by putting a cooler loaf into a hot oven.

Because sourdough has so many variables due to its surroundings, achieving tangy sourdough bread will have to be done by trial and error, with the help of the above tips.

For a Less Sour Sourdough

Perhaps you don't like the tang of sourdough because it is unfamiliar. Or perhaps your particular starter creates very sour bread and you'd like to minimize the tang. Either way, you can take a few steps in order to manipulate your sourdough into a less sour state.

- Feed your starter regularly. This helps to minimize the alcohol content which will help reduce the overall acidity of the sourdough.
- Give the dough a shorter rising time at a cooler temperature. The longer the rising period, the more acidity is produced by the organisms within the sourdough. By shortening the rise time and lowering the temperature you can minimize the acidity in the final product. In order to achieve both these conditions you will need to use more starter in the recipe.
- A larger percentage of sourdough starter in the dough allows it to both rise in a cooler location (as stated above) *and* have a shorter rising time. This will aid in taming the sourness in your sourdough. You may find you need to adjust the amount of starter you use by season: more starter in the winter and less in summer.
- Add baking soda. Baking soda is an alkaline substance. Adding it to sourdough neutralizes some of the acidity and gives the dough a little extra leavening boost.

Once again, each starter is individual, so play with some of the above steps to achieve your ideal level of sourness.

Using a Bread Machine to Make Sourdough



If you own a bread machine and want to use it to make sourdough bread, then you might be a little stumped. That is because most bread machines are designed to work with breads leavened with commercial yeast, and therefore only work with a very short rising period.

The thing about sourdough starter is that it is a very unique culture, whether you have created one from scratch yourself or used a pre-established one. This means that the rise time for each culture is going to be very different and hard to predict. You may find that even after you've baked with it several times the rise time is different enough for every batch that you wouldn't trust a bread machine to know when it is time to bake.

All that said, there are a few options for using a bread machine to work with sourdough:

1. If you are planning to buy a bread machine, find one that will allow you to program a longer rise period and change the programming in the middle of a cycle so you can determine the best time to bake. This should allow you to use the bread machine to mix the ingredients, knead the bread, allow it to rise, and bake it as long as you can determine when the rising time is up.

2. If your bread machine does not have a longer rise period option or the ability to change programming in the middle of a cycle, then you will have to be selective in how you use your bread machine. You can add your ingredients to the machine, allow it to mix the dough, allow it to knead the dough, and then transfer to oven-safe baking pans for the rise. Then you can determine how long a rise period it will need and bake at the best time for your bread.
3. You can also, by trial and error, manipulate your bread machine to achieve a particular result. So, you might add your ingredients (starter, flour, water, salt, etc.), allow the machine to mix and knead, then turn it off. Then you could stop the machine and restart it on a new cycle with a 12-hour time delay. This would have to be tried and tweaked to fit your starter's rise time and your bread machine's settings.

If you are considering purchasing a bread machine you might want to instead consider purchasing a mixer that will do the mixing and kneading of the dough and will allow you to determine the rise time necessary before baking.

How Altitude Affects Sourdough Baking

Bakers living at high altitudes have long known they must make adjustments to standard recipes. Altitude affects not only the baking time, but also the humidity or relative moistness of the finished product. That's because the atmospheric pressure is lower at high altitudes and lower pressure makes water evaporate faster. In fact, for every 500-foot increase in altitude, water will boil at 1° lower than it will at sea level. Since water boils at 212°F at sea level, if you live at a 1,000-foot elevation that means water will boil at 210°F. This is not a significant difference if you live below 3,000 feet, but it can change things considerably if you are living at 6,000 feet. While the difference in the temperature at which water boils mainly concerns moist-heat cooking, in baking naturally leavened or yeast-leavened breads, this difference affects the length of time it takes to bake a loaf.

Generally, when baking breads at high altitudes, you will need to allow more time than a recipe calls for. How much more time depends on your elevation. The easiest way to judge when your loaf of bread is done is to use a thin-tipped instant-read thermometer inserted into the bottom of the loaf. Usually 195°F is a good temperature to shoot for. You can go all the way up to 205°F, but higher than that you may notice the bread is drier and more crumbly than you'd like or that it gets stale faster. Experiment with various temperatures and settle on the one that suits your taste.

You may also want to raise the oven temperature by 25°F to account for the difference in atmospheric pressure. If you are using a convection oven that automatically reduces the temperature 25°F, just set it at the temperature you want, overriding the auto-function. For example, if your oven has a setting for "convection bake" that automatically sets the temperature at 325°F, you can manually adjust the temperature to 350°F or even 375°F. Free-formed artisan loaves bake best around 400°F, while loaves in pans do fine at 375°F. It pays to get familiar with the idiosyncrasies of your particular oven.

The amount of water you use in a recipe will also vary depending on your altitude. The higher the altitude, the drier the flour will be and the more water it will absorb. You can probably use less flour than the recipe calls for when you are at a high altitude. How much less will all depend on your location. Start with about one-fourth less flour and add additional flour only as needed. If you are working with a baker's percentage and you normally use a hydration of 68%, try using a 70% hydration. It's easier to knead in a little extra flour than it is to add more water.

Rising times decrease as altitude increases, so remember to adjust for this also. Keep in mind that the longer the rise time, the more complex the flavors will be, and this is a desirable goal. Try rising at cooler temperatures. (An old refrigerator set at 50°F makes a good “slow proofing” box.) Giving the dough at least two risings also helps. When the dough has doubled, punch it down and let it double again. Usually the second rise is faster than the first rise. Once you shape the loaves and put them into pans or baskets to rise, cover the loaves to prevent them from drying out and forming a tough skin on top that will thwart the nice “oven spring” you want to have. You can use plastic wrap, lightly-moistened flour sack towels, or the shower cap-style covers that are available commercially to cover the loaves while they rise. You might also use a covered proofing box or set a large kettle or bowl upside down over the loaves after you have sprayed them with a fine mist of cool water.

If you want a soft crust on your finished loaf you can brush it with melted butter instead. For a crispy crust, water is a better choice. Spray the loaves (or butter them) one more time right before placing them in the hot oven to bake.

With a little practice and a healthy dose of patience you will find just the right technique that works for you. Bread baking is an art and as such, there is no absolute one right way to do it.

A Comparison of Heirloom Wheat Varieties for Sourdough Baking



Many people don't realize is that the most widely cultivated and sold variety of wheat is not the only one. The modern wheat that is most widely available is actually not the same grain that existed in ancient times and was consumed as "wheat" up until the last century.

The differences come in the hybridizations, the number of chromosomes, and the resultant change in nutrition and chemical structure of the grain itself.

If you are interested in sourdough baking then you may be interested in learning about alternative forms of wheat, known as heirlooms. These heirlooms can be used instead of wheat, in various sourdough baked goods. Each has its own unique use and flavor, and for some, it may be more about the nutrition of the grain than its flavor.

There are three ways wheat's chromosomes can be arranged. There can be either two, four, or six sets of 7 chromosomes in a particular variety of wheat. These types are called, respectively, diploid, tetraploid, or haploid. The various chromosomes in a particular type of wheat will influence its flavor, density, gluten content, protein levels, and more

Kamut

Kamut, also known as Khorasan wheat, is an ancient wheat variety from the Khorasan region of Iran. It is botanically a form of *Triticum turanicum*. While it is twice the size of modern wheat, it is also lower-yielding in terms of a per-acre harvest.

The kamut grain is very high in protein and minerals and is a tetraploid wheat.

Kamut is known for its buttery flavor. It can be substituted for whole-grain wheat flour, and is especially suited to things like tortillas and crackers.

Spelt

Spelt, also known as hulled or dinkel wheat, is a hexaploid variety of wheat. It is a subspecies or close cousin to common wheat. It is thought that spelt came about as a hybrid of a domesticated tetraploid wheat, like emmer, and a wild goat-grass.

The spelt grain is rich in carbohydrates, protein, and minerals.

Spelt is similar to wheat in baking, but produces a coarser, less spongy bread loaf than wheat. It is good for biscuits and other baked goods such as quick breads and crackers.

Emmer

The emmer variety of wheat, commonly known as farro in Italy and other regions of the world, is known for giving a good yield even in poor soil.

The emmer grain is similar to spelt and kamut in nutritional value. It is a tetraploid wheat.

Emmer has been used as animal feed, to make bread in traditional Turkish societies, and is widely used as a whole grain in dishes in Tuscany.

Einkorn

Einkorn is most similar to what one would find in a wild wheat. It is a diploid wheat, having only two sets of chromosomes, the fewest of any wheat known.

It also has a different type of gluten than the modern wheat gluten that we are familiar with. And while it is less productive in the field, it has also been shown to be easier to digest than modern wheat.

Einkorn can be used to make a whole host of sourdough products, from loaf bread to pizza crust. Because of the different type of proteins the results won't be exactly like a modern wheat bread, but the flavor and nutrition will blow you away.

Hopefully with the above information you can move forward in your artisanal sourdough baking into a world of ancient, unadulterated grains.

How to Adapt Any Recipe to Become a Sourdough Recipe

Sourdough is well known for its ability to raise yeast-based breads. It lends a lovely tang, or not, depending on your preference. It also helps to make the grain more digestible by pre-digesting the fibers and anti-nutrients.

Once you get your sourdough starter alive and bubbly and you have mastered that great sourdough loaf recipe, you may want to branch out and try your hand at other sourdough baked goods.

Most of us have recipes passed down in our family that we love. It might be Nana's banana bread or Uncle Joe's sandwich bread. Many of these traditional favorites can easily be converted to sourdough with the use of your sourdough culture for the health and money-saving benefits.



To successfully adapt recipes to use your sourdough starter, you will need to perform a bit of trial and error. First you must determine whether your recipe is one calling for yeast, like a bread loaf, or a quick bread (like pancakes) calling for baking soda or baking powder.

Adapting Yeast Recipes to Sourdough

Theoretically speaking, if you know what the hydration level of your sourdough starter is you should be able to easily adapt a yeast bread recipe to use sourdough.

Remember that a 100% sourdough hydration level means that you have equal weights of flour and water. So if you have 8 ounces of starter you have 4 ounces of flour and 4 ounces of water, by weight.

The other thing to consider in the recipe you wish to adapt is the amount of yeast. The rising power of one packet of yeast is about equivalent to one cup of sourdough starter, depending on the health of your starter.

Knowing these two factors you can approximate a substitution of one cup of sourdough starter for one packet of commercial yeast. You would then lower the flour and water in the recipe according to your hydration levels, being sure to measure it again by weight.

So, for instance, if your recipe calls for 1 cups of liquid, 3 cups of flour, and 1 packet of yeast, you can substitute 1 cup of sourdough starter for the yeast, then use only 1/2 cup of liquid and 2-1/2 cups of flour.

Once you have your sourdough mixed together and flour and water adaptations accounted for, you must also account for the longer rise time needed for sourdough. This isn't as complicated as it may seem, as you will simply allow for a 4-hour (or more) rise time instead of the instant yeast rise time that is usually around 2 hours.



Adapting Quick Bread Recipes

Quick bread recipes are slightly trickier in that most of them were created with the quick leavening of baking soda or baking powder in mind. So perhaps a little background on each is in order.

Baking soda, or the chemical compound sodium bicarbonate, is an alkaline substance that is used in baking quick breads. This alkaline powder reacts with the acidic element in a recipe (i.e., buttermilk, vinegar, etc.) to create gases that produce the rise in a pancake, biscuit, or loaf of zucchini bread.

Baking powder contains both an acid and alkaline component which is why you can make pancakes or biscuits with milk (only slightly acidic) as the liquid and still have the gases creating a rising power. You can substitute 1/2 teaspoon of baking soda (alkaline) and 1/4 teaspoon of cream of tartar (acid) for 1 teaspoon of baking powder to achieve the same result.

Sourdough is acidic in that it contains lactic and acetic acids that will act on your recipe in the same way as the cultured dairy products or vinegar that are often called for in a recipe.

If you are interested in using sourdough in such recipes you may do so in a few ways.

Use your sourdough to add a tang to quick breads. If you are only interested in adding the tang of sourdough to your pancakes or biscuits then you could substitute one cup of sourdough starter for the equivalent amounts of flour and water, by weight. This gets a little tricky when you have a recipe where the liquid is a only small amount of milk, because you are substituting water for something that contains fats, proteins, and carbohydrates (milk).

Also keep in mind that your sourdough starter will act as an acidic element to a recipe. So if you are using a recipe that calls for buttermilk you may be able to use regular milk instead since the sourdough will provide the acidic element for baking soda to react with.

Use your sourdough starter to create longer-soaked (fermented) quick bread. This can be done similarly to the method of substituting sourdough for yeast above. Simply replace the water and flour by weight with your 100% hydration starter.

So if you wanted to make something like ordinary biscuits and use sourdough you would replace some of the flour and liquid with your sourdough starter, along with the baking soda and baking

powder (which you will use less of than in most recipes), then allow the culture to raise the biscuits for 4+ hours,

For a thinner battered quick bread such as pancakes you can actually use straight-up sourdough starter without any additional flour or water. You may want to alter the hydration level of your sourdough to produce a thinner or thicker pancake as desired, but no long soaking time is needed since you aren't using any additional flour.

As with other elements of sourdough baking, you will want to play with recipes in order to achieve your desired results. With these tidbits in mind, though, you should be able to manipulate any of your favorite recipes to utilize sourdough.

The Formula



Assuming that you keep your sourdough starter at 100% hydration you can safely assume that half of the quantity of your sourdough starter is flour and the other half water. You can therefore replace part of the flour and liquid in the recipe with the sourdough starter itself.

If, for instance, you have a recipe that calls for 2 cups of flour and 2 cups of buttermilk, as in a pancake recipe, you could combine 1-3/4 cups of flour, 1-3/4 cups of buttermilk (or milk, since the sourdough is also acidic), and 1/2 cup of sourdough starter. (The sourdough starter replaces 1/4 cup of the flour and 1/4 cup of the buttermilk.)

This mixture can be combined the night before and left to culture on the counter. The next morning add the rest of the ingredients, including a bit of baking soda to react with the acidity of the sourdough and create a rise, and mix just to combine before cooking into fluffy delicious pancakes.

If you want your quick bread to be baked right away, then simply skip the fermentation step. It won't be as easy on the tummy, but you will get a bit of extra rise from the yeast in the sourdough starter. Just proceed with the recipe as written.

Beyond Quick Breads

Once you start using sourdough in your baked good recipes you may find that it really helps make lighter breads that are easier to eat. And so you might want to start souring just about all of the grains you eat.

You can use the exact same formula as above, replacing 1/4 cup each of liquid and flour with 1/2 cup sourdough starter, in everything from porridge to cake to cookies to granola.

If you love those sourdough benefits and flavor then just let the dough or batter culture for at least 8 hours before cooking up with the rest of the ingredients.

Using Rye Flour in Sourdough



Sourdough rye bread is a traditional bread throughout the Scandinavian countries, many parts of Central Europe, and Germany. In his book, *Nutrition and Physical Degeneration*, Weston Price mentions the diet of the people in the Loetschental Valley of Switzerland consisting primarily of hearty rye bread and cheese. There is something wonderfully satisfying about a good loaf of tangy sourdough rye bread. Rye has a delicious and bold flavor.

The gluten in rye is inferior to that of wheat, making rye a little tricky to bake with at first. The gas-trapping capacity of rye is less than that of wheat, making it unstable when used by itself, so most bakers mix rye with wheat flour to give the dough more structure. As in all adventures with sourdough, practice makes perfect. You can produce a great loaf of rye bread by understanding some of the properties of the flour.

Rye flour contains pentosans, which are polysaccharides (chains of sugars) similar in structure to starches and cellulose. When mixed with water these pentosans soak up the liquid to form a viscous gas-trapping gum. This viscosity tends to make rye bread dense and somewhat flat. Since a successful loaf of bread depends on the viscosity as well as the elasticity of the dough, adding wheat flour (which contributes elasticity) helps to balance the two. Viscosity is affected by mechanical mixing, pH, temperature, and percentage of salt. It is best to knead rye breads by hand, so as to not over-knead. Rye is very hygroscopic (takes on and holds water), allowing rye bread to stay fresher longer than wheat bread.

Rye and wheat grains both contain amylase, the enzyme that breaks down starches. The structure of a loaf of baked bread comes from starch having been gelatinized by the presence of water and heat. This gelatinized starch is susceptible to the action of amylase. Rye amylase is more heat-stable than wheat amylase, so a loaf of bread made with predominantly rye flour tends to be flat from the action of the amylase on the starch.

Adding wheat flour to the dough gives the finished loaf more structure since more of the amylase has been inactivated, leaving more starch to gelatinize. The acidic pH of naturally fermented dough also helps to inhibit the action of rye amylase. That may be why all traditional rye breads are made from sourdough. The starch is protected from the amylase until all of the amylase has been inactivated by the baking process. Salt inhibits the action of amylase as well. Using too little salt will contribute to a flat loaf.

Wheat gluten retains gas in the loaf until it is about half baked, somewhere between 125° and 165°F. Most of the “oven-spring” (rapid rising of the dough) is completed by that point. Rye dough, on the other hand, loses much of its gas early in the baking cycle (about 95°F) so there will be little oven-spring in rye breads. If you want a loaf with lots of volume you will need to increase the amount of wheat flour in the dough.

What is the correct proportion of wheat to rye flour? That depends of what kind of loaf you want to make. If you are looking for a fairly light sandwich-type loaf, you might want to limit the rye flour to about 20% of the total flour. Most traditional German rye breads contain around 30% rye, but they also rely on the fermentation process to lower the pH and thus inhibit the action of amylase. One of the traditional European rye breads, Vollkornbrot, contains 100% coarse rye meal. It has very long leaven and fermentation times and produces heavy, dense, and chewy loaves. They are delicious, although not generally what the American palate is accustomed to.

Hopefully, now that you know a little more about the properties of rye, you'll feel comfortable experimenting with sourdough rye bread until you find the loaf that is exactly right for you.

How to Use Kefir as Sourdough



Kefir and sourdough have a lot in common. Both are cultured foods. Both improve the nutritional value of whatever they are culturing (milk, flour, sweet water). Both contain yeast, bacteria, and acids.

So why not use kefir in the same manner as a sourdough starter: to leaven and ferment your bread?

Make a Kefir Sourdough Starter

Because kefir has many of the components of sourdough, you can make a type of sourdough starter directly from kefir! The cultures in the starter will be the same as in the kefir so you will know you are getting a wonderful fermented food.

To make a kefir sourdough starter:

1. Combine 1 cup each freshly ground flour and milk kefir in a quart jar.
2. Stir well to combine.
3. Place a breathable lid such as a towel or coffee filter over the jar and secure it tightly.
4. Allow to culture 2 to 3 days at room temperature or until it is bubbling and active.
5. Use in your favorite sourdough recipes.

Use Milk Kefir Directly as the “Sourdough Starter”

Milk kefir can be a direct stand-in for a sourdough starter whether you don't have a sourdough starter going, or you don't have the time to create the kefir sourdough starter above.

Simply replace the liquid in your favorite sourdough bread recipe with kefir. For the flour, use the amount of flour in the recipe plus the amount of starter given. So if your recipe calls for 2 cups of starter, 3 cups of flour, and 1 cup of water, use 5 cups of flour and 1 cup of kefir. You may need to adjust the amount of kefir to get the right consistency to the dough.

Mix and knead as usual. Allow to ferment in an oiled bowl for about 24 hours, or until doubled in size. Punch down and place in a buttered loaf pan. Allow to rise until it reaches the top of the pan, then bake as usual.



Benefits of Using Kefir as Leavening

Keeping it simple. If you are already making milk kefir on a daily basis then you've got leavening on hand. Furthermore, if you can use something you're already making as a sourdough starter then you don't have to create and maintain a separate sourdough culture.

Better keeping qualities. Because of the acids and bacteria naturally present in kefir, many find that kefir-leavened breads, much like sourdough, tend to keep longer than their commercial yeast-based counterparts.

Starting with a Reliable Culture. If you have ever tried to create a sourdough starter by catching wild yeasts then you know that it can be hit or miss. Some wild yeasts produce great bread, others not so much. Starting with kefir can give you the peace of mind that only truly established cultures can bring. So, definitely give kefir-leavened bread a try. You can create truly great bread with three simple ingredients: flour, salt, and kefir.

Introduction to Working with Gluten-free Sourdough



Not everyone can have wheat, even when it has gone through the fermentation process. If you are sensitive to wheat and gluten then you might think that sourdough is out of your grasp. However, you may still be able to enjoy homemade sourdough breads.

If you are accustomed to baking with wheat you will find some differences in baking with gluten-free flours, such as:

- Your gluten-free sourdough starter will require more frequent feedings to become vigorous. Instead of once or twice per day (at room temperature), your starter may require 3 or 4 feedings in a 24-hour period.
- Gluten-free sourdough will store differently than a wheat-based culture. Because it is touchier than a wheat starter you might consider storing it in the refrigerator for only 3 or 4 days at a time.
- Gluten-free sourdough bread may not require kneading. The kneading done with a wheat sourdough bread is performed in order to develop the gluten, which is helpful in getting a good rise. Gluten-free sourdough obviously does not contain gluten that needs to be developed and therefore the kneading stage may be skipped.
- Most gluten-free recipes have a different dough texture than their wheat-containing counterparts and sourdough bread is no different. You may end up with a batter that requires rising and baking rather than a dough that can be easily handled and kneaded.

- Because of the looseness of a gluten-free dough, you will have to bake your breads in something that contains walls. So, where a wheat bread may be baked on a cookie sheet in a rustic boule shape, a gluten-free sourdough bread will have to be baked in a loaf pan, a Dutch oven, a muffin tin, or a similar formed container.

Gluten-free Flours

Various nutritious whole-grain gluten-free flours can be used in baking gluten-free sourdough bread, including:

- brown rice
- quinoa
- amaranth
- buckwheat
- bean flours
- corn flour
- sorghum

You will sometimes see starches added to recipes. These starches, if used minimally, can help with the final sourdough bread product. These may include:

- potato starch
- tapioca starch
- arrowroot

Do not be overwhelmed by the differences between wheat and gluten-free sourdough, though. Many of the major concepts of sourdough baking remain the same when dealing with gluten-free sourdough: the long rise/fermentation time, the use of only whole, real foods in the recipes, and the flexibility to switch flours when desired. You'll just want to stick with a gluten-free flour if needed.

Click here to view a [recipe for making Gluten-free Sourdough Bread](#).

We highly recommend [The Art of Gluten-free Sourdough Baking, by Sharon Kane](#), for excellent recipes as well as expert gluten-free sourdough techniques.



BITS AND BOBS

tips for making sourdough



Ten Tips for Working with a Traditional Sourdough Culture

Working with a traditional sourdough culture is a rewarding experience and with a few techniques, you can make delicious bread and other baked goods your whole family will enjoy! Remember that sourdough is versatile: you can make baked goods ranging from not-the-least-bit sour to very sour; it's all about fermentation time. Sourdough can also be used to make many baked goods beyond bread. Options include cake, cookies, English muffins, pita bread and more!



Ten Tips for Working with Traditional Sourdough:

1. Be sure your sourdough starter is fully active prior to baking. Follow [these instructions for making fresh sourdough starter](#) so you will have fully active yeast and bacteria to properly leaven your bread.
2. Measure ingredients using a scale rather than measuring cups whenever possible. Your measurements will be much more accurate and your results more consistent.
3. The dough should be slightly sticky when you start the kneading process. If it's not sticky, there is too much flour and you will have dry bread. Use wet hands and a dough scraper to facilitate kneading. Add only very small amounts of flour at a time to facilitate kneading.
4. Knead your dough by hand for 15 to 20 minutes. You can split this process up into sections, kneading for 5 to 10 minutes at a time, taking a 10 to 20 minute break then return to kneading.

Try not to use a mixer for the kneading process. It heats up the dough too much and home mixers don't do a good job of activating the gluten in the flour effectively. If you do use a mixer, plan to knead the last five minutes or so by hand. You'll know you're done when you can take a small piece of dough and stretch it so that it gets thinner and thinner until you see light through it like a window pane. If it breaks before being stretched that thin, keep kneading.

5. After kneading, shape your loaf, cover it, and let it sit for at least 4 hours but up to 24 hours (depending on your specific sourdough starter and ambient temperature). The wild yeast present in sourdough does not rise nearly as quickly as commercial yeast. The timing of this last step also influences the sour nature of the finished product. A 24-hour rise time will produce a much more sour bread. If using a proofing basket to shape your dough, use thick linen cloth and brown rice flour to avoid sticking.
6. If using a shorter rise period (4 to 12 hours), a second rise (proofing) period is an option but isn't required. If you desire a second rise period, simply punch down and reshape the dough following the first rise and allow the dough to rise again.
7. Bake the sourdough bread on a baking stone whenever possible. Heat the stone in the oven for up to an hour.
8. Use a thermometer to determine when the bread is finished baking (internal bread temperature of 195° to 210°F). The bread should sound hollow when thumped.
9. Let the bread cool for at least 20 minutes before slicing.
10. If you don't have a 8 to 24 hour lead time to let the bread rise, you can add a pinch (just a pinch!) of instant yeast. (Make sure it's the instant variety.) You will still get the complex flavor of the sourdough but a much faster rise time.

Sourdough Tips and Tricks

After you've baked with sourdough for some time you will learn all sorts of little tricks for creating different results. Here are just a few to keep in mind.



To achieve a lighter bread with large holes use as little flour as possible in the mixing/kneading phases and leave it a bit sticky.

For a more sour sourdough you can manipulate the hydration level down to 75- or 50%. This will be quite stiff but it should knead into the flour and water of a bread dough.

If you're interested in making fluffy sourdough pancakes without having to soak flour overnight, keep a separate stiffer sourdough starter, say 80% hydration. That will allow you to just mix in eggs, flavorings, etc. and not end up with a runny pancake batter.

To ensure an active sourdough starter look for a frothy bubbiness to your starter, a growth of the starter in its vessel (sometimes doubling in volume), and a slightly sour smell. If you are at all concerned with a lack of activity, just check to make sure it is in a warm enough environment (70° to 85°F) and feed it every 12 hours until you are sure your sourdough is active.

If you feel your starter is just a big sluggish, check these two all-important variables. First, is the water you are feeding it pure or does it contain chemicals like chlorine. If you must use chlorinated water, some say you can leave it out overnight (uncovered) to allow the chlorine to dissipate. Next, is

the temperature you are keeping it at consistently between 70° and 85°F? If your location is prone to drafts or sudden temperature changes you might consider moving your sourdough.

Slashing loaves with a very sharp knife or razor blade isn't just for show. When you place dough in a hot oven the yeasts work a little over time right before they go dormant due to the high temperatures. This produces something called oven spring, in which your bread rises a bit more in the oven. This is a good thing, in that it gives your bread a nice light texture. The only downside is that if you have a lean dough (i.e. no fat in the ingredients), you might end up with a misshapen loaf. Slashing the loaf in a desired pattern gives your dough a direction to spring so that you can control the end shape of the loaf.

To know if your finished loaf is really done, you have a couple of options. First there is the thump test in which you turn your hot loaf over and flick it with your finger. If it sounds hollow it is done. The other, more scientific and certain way to go is to check the internal temperature. If your loaf is between 190° and 210°F, then it is cooked through.



Troubleshooting Sourdough

Sourdough is a living thing. As such it can be unpredictable and constantly in flux due to changes in its environment. Most sourdough problems can be easily remedied or are not worth worrying about. However, there are a few situations that might require some extra care.

Reviving a Hibernated Starter



If you've allowed your starter to come to a hibernated state in which it doesn't appear to have much life, then you'll need to revive your starter. The culture may look lifeless, but on the microscopic level you may still find life that you can recover with a little extra TLC.

This means more than just feeding it. Sourdough should have more yeasts than lactobacilli to be effective in making good breads, so you're going to need to give it some special care in order to build up the yeasts.

To jumpstart a starter that looks lifeless, take just a few tablespoons of the hibernating starter and bring it to room temperature. Now feed it eight times as much flour and five times as much water as the amount of starter that you are starting with.

For instance, if you have 2 tablespoons of starter, use 16 tablespoons of flour (1 cup) and 5 tablespoons of water.

Repeat this twice a day, in 12-hour intervals, and start each feeding by discarding half of the starter.

By giving the starter large feedings of flour you should be able to revive it in a way that will tip the present organisms in favor of the yeast.

If the Starter Smells or Tastes of Alcohol

One of the organisms present in a sourdough culture is alcohol. While this is normal, too much is not a good thing and can be a sign that you need to change the way you are caring for your starter.

Too much alcohol in the sourdough usually means that you are not feeding your starter frequently enough. Increase the frequency of feeds (every 8 hours instead of every 12, for instance) and see if that resolves the alcohol flavor or smell of the starter.

Getting the Starter Bubbly

What you should see in a sourdough starter is happy, bubbling activity. This is an indication of health in that the organisms in the sourdough culture are feeding off the flour you give it and creating gases (bubbles).

If your starter is not bubbly then you need to feed it and allow it to go through its bubbling/proofing period. After you feed it you should see bubbling action within 4 to 12 hours. Feed it again at 12 hours to make sure your culture is getting enough food.

If after several feedings you still do not see bubbling action, your starter may be damaged or even dead. If that is the case, you may need to start or acquire a new one.

Dealing with Mold

While mold on a sourdough starter is fairly rare, it does happen from time to time. The cause is usually some sort of contamination with food or soap residue, or weakened yeast due to a forgotten feeding.

If you find mold you can try to salvage your sourdough starter or you can start over. Please exercise good judgment when salvaging a moldy starter. It is one thing if the mold is only infecting the surface, but an entirely different problem if it is penetrating the whole starter below the surface.



If you decide to save the starter you should first remove the mold from the surface. Next, using a new (clean) utensil, remove a small portion of the sourdough that wasn't near the mold. One tablespoon will suffice. Put that tablespoon into a very clean container, and add equal parts flour and water (by weight). If you are measuring by volume, use one part starter, one part water, and slightly less than two parts flour. Mix, cover with a breathable lid, and allow to proof.

Once it is proofed, or within 12 hours, feed the starter again using the same ratio (one part flour and one part water by weight; or one part water, almost two parts flour by volume). Continue to feed for several days and watch carefully for any signs of mold. If all goes well and there are no more signs of mold or off smells, then you should be able to use it in baking or store it in the refrigerator.

Remember that sourdough is a living thing that can be unpredictable. Thankfully it is also a fairly resilient thing that can often be brought to life even after the biggest of trials.

Frequently Asked Questions

Sourdough Starters

Q. What is sourdough?

A. Sourdough is an ancient method of capturing wild yeast to leaven baked goods. A sourdough culture is originally created by mixing flour and water and allowing the mixture to sit on a counter, preferably by an open window for a period of time to capture wild yeast. Once established a sourdough culture is easy to care for, can potentially last indefinitely, and can be used to create a variety of baked goods.

Q. Where did your sourdough cultures come from?

A. Our sourdough cultures originated all over the world and carry the unique yeasts from their respective geographic regions.

Q. What ingredients do your sourdough cultures contain?

A. Our sourdough cultures contain water, flour and wild yeast. We use only organic flour and filtered water to perpetuate our sourdough cultures.

Q. Why use sourdough instead of commercial yeast?

A. Sourdough has several advantages over commercial yeast:

- Sourdough is the most natural and traditional method for leavening baked goods. While commercial yeast is manufactured, sourdough is perpetuated through a natural process.
 - Sourdough naturally provides a more complex taste to baked goods.
-

- Sourdough is more versatile. Depending on the amount of time you ferment the sourdough (see below), you can achieve a bread ranging from no hint of sourness to a very sour bread.
 - With a sourdough culture, you never again need to buy yeast. A small amount of flour and water each week will keep your sourdough culture fed and healthy.
-

Q. How is working with sourdough different from working with commercial yeast?

A. There are a few fundamental differences between baking with sourdough and baking with yeast:

- Sourdough does require minimal care (weekly feedings)
 - You do have to do a bit of advanced planning to bake with sourdough as your starter will need to be fed 1 to 3 times prior to using it for baking. (See below for information on making "fresh starter" for recipes and for fermenting sourdough to achieve a more sour flavor.)
 - Sourdough requires a longer rise time than commercial yeast. Plan to allow your sourdough bread 4 to 24 hours to rise (depending on temperature, other environmental factors and desired sourness). If you do not have that much time to allow the bread to rise, a pinch (just a pinch!) of instant commercial yeast (make sure it's the instant variety) will speed the rise process while retaining the complex sourdough flavor.
-

Q. Are your sourdough cultures dairy-free? Vegan?

A. Our sourdough cultures contain no animal byproducts.

Q. Do you carry a gluten-free sourdough starter?

A. At this time we offer a [Brown Rice Flour version of our New England Sourdough Starter](#). Please note: although this starter is maintained with brown rice flour, it may contain trace amounts of gluten. [Click here to view a recipe for gluten-free sourdough bread](#).

Q. Are sourdough cultures reusable?

A. Yes, our sourdough cultures are traditional starter cultures and are meant to be used for many years. We even know someone who has had their sourdough culture for over 30 years!

Q. Some sourdough starters available online involve just adding a small amount of powder to each batch. How are your sourdough cultures different?

A. Cultures that require you to add some powder to each batch are manufactured yeasts of sorts, not true sourdough starter. We sell only traditional sourdough cultures.

Q. I found instructions online for making a sourdough starter from scratch. What are the advantages of purchasing an established sourdough culture?

A. Although it is possible to [create a sourdough culture from scratch](#), using an established sourdough culture has several advantages. First, it's easier. Creating a starter from scratch involves a lot of effort over a seven-day period (feeding the starter each day, switching containers, etc.). Second, it is faster to use an established culture as it can generally be ready to bake within 1 to 4 days (no changing of containers required). Finally, with an established starter, you can be assured that the sourdough culture will have a pleasant taste. Not all wild yeast is created equal and we don't all live somewhere with pleasant tasting yeast so capturing wild yeast where you live may not yield the desired effects.

Choosing a Sourdough Starter

Q. What are the primary differences between sourdough starters?

A. The primary differences between the sourdough cultures are the types of flour they were grown with (white, rye, or whole wheat) and the different wild yeast from their respective geographic regions. Several cultures do have some unique properties:

- Ischia tends to be a bit more sour when allowed to fully ferment.
 - New Zealand Rye sourdough is our fastest-proofing culture (generally just under 3 hours: adjust your recipes accordingly).
 - Alaskan has an uncharacteristically short proof period.
 - Austrian has a longer proof period than most other sourdough cultures.
 - Many people claim the San Francisco sourdough culture has a particularly unique taste.
 - New Zealand, Swedish, and Danish cultures are made with rye flour.
 - Flemish-style Desem is made with whole wheat flour.
-

Q. Which sourdough culture should I choose if I want to make whole wheat bread?

A. Our Flemish-style Desem sourdough is cultured with whole wheat flour and makes delicious whole grain bread. However, any of our sourdough cultures can be converted for use with whole wheat flour.

[Click here](#) for more information on that process.

Q. Which sourdough starter is best for making sandwich bread?

A. Any of our sourdough cultures work well for making sandwich bread. Camaldoli is a favorite with many customers.

Q. Are your sourdough cultures very sour?

A. Most of our sourdoughs are only slightly sour (with the exception of our Ischia culture which is just a bit more sour than our other sourdoughs). Sourdough actually refers to a method of capturing and perpetuating wild yeast rather than the dominant taste that results. Our sourdough cultures come from all over the world, each sourdough culture has its own unique taste based on the geographic differences and different varieties of wild yeast available. Sourdough provides a way to utilize wild rather than commercially grown and processed yeast in baked goods. It is also very cost-effective as it requires minimal care to perpetuate indefinitely. If you desire a truly sour taste to your baked goods, there is a method to develop the sourness of the sourdough culture for a specific baking project and

instructions for doing so will be included with your order. Keep in mind that the sourdough bread purchased in most stores is not a true sourdough but has had a sour-tasting substance added to the dough.

Q. The descriptions for the sourdough starters refer to things like making French bread, pizza, etc. Do I need a separate sourdough culture for each of these things?

A. No! Ultimately sourdough is simply a leavening agent (like commercial yeast) so it is incredibly versatile. It is tempting to purchase and use multiple sourdough starters but unless you have a very specific reason for using more than one sourdough culture, we strongly recommend sticking to just one. A single sourdough culture can be used to make a variety of baked goods (bread, pizza dough, biscuits, cookies, etc.). Since sourdough starters do require weekly care, it is easy to get overwhelmed with multiple sourdough cultures. You can easily convert part of your starter to work with different flour types (see below for instructions) so even if you only buy one sourdough culture, you can create different varieties from that one if you so desire.

Q. What is the difference between fresh and dried sourdough culture?

A. Fresh sourdough culture is a portion of live, recently fed sourdough. It is usually shipped with a cold pack to ensure proper temperature is maintained and must be fed immediately upon arrival. Fresh sourdough culture can be ready for baking within 36 to 48 hours. Dried sourdough culture is shipped in a dehydrated form and is shelf-stable for at least several months (keep in a cool dry place) so it does not have to be used immediately. Dried sourdough culture is more appropriate if you are very busy or are planning to give it as a gift. Dried sourdough culture can be ready for baking within 3 to 4 days. Dried sourdough culture is also available for international shipping.

Starting and Maintaining a Sourdough Culture

Q. What is involved with caring for a sourdough culture?

A. Sourdough cultures should be fed with flour and filtered water approximately once a week. If you use your sourdough culture to make baked goods during the week, the process involved will feed the culture for the week. If you do not use the sourdough culture for baked goods during the week, the feeding process is simple and takes only a few minutes.

Q. Where should I keep my sourdough culture?

A. If you use your sourdough culture daily to make baked goods, you can keep it in a container on the counter. If you bake with your sourdough culture only a few times a week or less and don't want to feed the starter every day, it should be kept in the refrigerator with a tight-fitting lid.

Q. Does room temperature matter when working with sourdough starter?

A. Sourdough starter will generally proof at temperatures between 65° and 85°F, but will proof best when kept between 70° and 85°F.

Q. Do I need to keep my sourdough away from my yogurt, kefir, kombucha, etc.?

A. Yes, it is important to keep at least several feet (and preferably more) between all cultured or fermented foods when they are actively fermenting (on the counter, lids off). If your cultures are capped and stored in the refrigerator, space between them isn't necessary. Also, keep in mind that commercial yeast can contaminate a sourdough starter so keep rising bread dough or open packages of bread made with commercial yeast at least a few feet (and preferably more) from your sourdough starter.

Q. How do I feed my sourdough starter?

A. Simply remove your sourdough culture from the refrigerator. If a dark liquid has formed on top, discard the dark liquid. You may need to discard a portion of the starter as well to make room for the

flour and water. Mix in the new water and flour. Stir vigorously ensuring you incorporate plenty of air. Allow the starter to sit lightly capped at room temperature for a few hours then return the starter to the refrigerator.

Q. Am I supposed to weigh the starter, flour, and water to determine the amounts to feed the starter or can I just use measuring cups? What if I don't have a scale?

A. The best way to determine feeding amounts is to weigh the ingredients and use equal amounts of starter, flour, and water (by weight). Weighing flour in particular is superior to using a measuring cup because the density of flour varies significantly between types of flour as well as how settled the flour is in the container. If you will be working with sourdough often, it is worth purchasing a small kitchen scale (the digital type is easiest to work with) as you'll generally have better results. However, if weighing ingredients isn't an option, feed the sourdough starter using one part starter, one part water, and a little less than two parts flour. For example, if you have 1/2 cup of starter, you would feed it with 1/2 cup of water and a little less than 1 cup of flour.

Q. Which flour should I use to activate my sourdough starter?

A. To initially activate your sourdough starter, we recommend using the type of flour to which the starter is accustomed. For white-flour sourdough starters (the packet will list "white wheat flour" as an ingredient), use regular white flour. Unbleached is fine. For whole-wheat starters, rye starters, kamut starters, spelt starters, and brown rice starters, use the specific type of flour the starter has been grown in. Once your sourdough starter is fully activated (bubbling and rising reliably), if you wish to switch to a new type of flour you may do so. Click here to view the instructions for [switching your sourdough starter to a new type of flour](#).

Q. Can I use freshly ground flour to feed my sourdough starter? To bake sourdough bread?

A. Feeding your sourdough culture with freshly ground flour is problematic as sourdough culture prefers aged flour. Therefore we recommend placing your freshly ground flour in a bowl on the

counter covered lightly with a dish towel for at least a week before using it to feed your sourdough culture. Once it is time to bake bread, you can use freshly ground flour as the flour portion of the bread recipe.

Q. What type of water should I use to care for my sourdough starter? Is tap water okay?

A. While we recommend using water that is free of contaminants and additives (such as chlorine), sourdough is fairly resilient and can generally handle tap water provided it is of a quality you consider safe to drink.

Q. How often should I feed my sourdough starter?

A. If your sourdough starter is kept in the refrigerator, you will need to feed it weekly or whenever you take it out to work with (whichever is more frequent). An exception is the brown rice sourdough starter which must be fed every few days. If necessary, sourdough starters can generally be kept in the refrigerator without feeding for up to a few weeks if required (this does not apply to brown rice flour sourdough starter which must be fed frequently) but we do not recommend skipping weekly feedings unless absolutely necessary.

When your sourdough starter is out of the refrigerator, it must be fed every 4 to 12 hours depending on the specific starter and the conditions in your home (room temperature, etc.).

Q. I activated my packet of sourdough starter two days ago and have been feeding it regularly. How long before it gets bubbly?

A. At room temperature (68°F), a newly activated packet of sourdough starter will usually take 3 to 5 days to become bubbly. Generally speaking, cooler temperatures will slow the process down and warmer temperatures will speed the process up. It also speeds the process a bit to have a more frequent feeding schedule such as every 8 hours versus every 12 hours. Occasionally it can take up to 7 days for the sourdough starter to fully activate (assuming a room temperature of at least 65°F and

regular 12-hour feedings). Please be patient during this process. Click here to view a [video on activating a sourdough starter](#).

Q. I just started working with the packet of sourdough starter. How many times will I need to feed it before I can put it in the refrigerator?

A. It is important to continue feeding the starter until it's reliably bubbly a few hours after feeding. Getting to that point generally takes 3 to 7 days of feeding the starter every 8 to 12 hours (every 2 to 4 hours for brown rice sourdough starter). Once the culture bubbles and rises reliably within a few hours of feeding, it can be used for baking or transferred to the refrigerator for storage.

Q. My sourdough starter has been in the refrigerator. How many times should I feed it before baking with it?

A. We generally recommend a minimum of three feedings 8 to 12 hours apart (2 to 4 hours apart for brown rice sourdough) prior to baking with the starter to ensure the yeasts come out of hibernation and are fully active.

Q. My refrigerator was too cold and I accidentally froze my sourdough culture. Can it be saved?

A. Freezing normally won't harm your sourdough culture and in fact is a way to preserve the culture long-term if you need to take a break from caring for your sourdough culture. Simply defrost it in your refrigerator then work with the starter as you normally would.

Q. I was keeping my sourdough starter in the oven (turned off) to keep it a bit warmer than my house temperature. Unfortunately the oven was turned on by a family member. Can my sourdough culture be saved?

A. Unfortunately heat is normally fatal for a sourdough culture. Depending on the exact circumstances, you may try feeding it to see if it bubbles up (a sign it is still alive) but most likely you will need to discard it and obtain a new culture.

Q. My sourdough starter has developed dark liquid on top. Is this normal?

A. Yes, the dark liquid is a form of naturally occurring alcohol known as hooch. It is harmless but does need to be poured off and discarded prior to stirring and feeding your starter. Hooch is generally a sign that your sourdough starter has run out of food to eat and needs to be fed immediately. If hooch is forming on your starter regularly, start feeding the starter more often as it's not healthy for the sourdough starter to run out of food on a regular basis.

Q. My sourdough starter smells like alcohol. Is there a way to fix it?

A. When sourdough starter isn't fed often enough or feedings are skipped, it is common for an alcohol odor to develop. When a sourdough starter runs out of food, it will begin consuming discarded yeast as well as its own waste, leading to the odor. The best way to prevent this from happening is to feed the sourdough starter more often. How often a sourdough starter is fed is a function of the nature of the particular variety of starter, how active the starter is, and room temperature, so it may take some adjustment and experimentation to find the best feeding schedule for your situation. Most sourdough starters do best being fed every 8 to 12 hours when not stored in the refrigerator. Some varieties such as brown rice sourdough starter may need to be fed more often (closer to every 4 hours).

To correct an existing alcohol odor problem, you can sweeten your starter by taking 8 ounces (1 cup) of your sourdough starter and mixing it with 4 ounces of flour (1/2 cup) and 4 ounces (1/2 cup) of water. Stir thoroughly, then let the starter sit at room temperature until it's nice and bubbly before returning it to the refrigerator. This method is also useful for correcting an overly sour starter. If this method is not successful, [contact us](#) for further instructions.

Q. I've been feeding my starter but now I have a gallon of sourdough starter. What can I do with it? How do I feed my starter without making too much?

A. Because feeding sourdough requires equal parts (by weight) of starter, flour, and water, it's easy to end up with a lot of sourdough very quickly. There are a couple of options:

- Discard some of the sourdough starter before feeding. You can actually maintain a sourdough starter using as little as a tablespoon of starter and equal amounts (by weight) of flour and water. Most people however will simply discard all but 1/4 to 1/2 cup of sourdough starter and then feed that amount to avoid ending up with too much sourdough starter. (This method allows you to keep the starter in a quart-size jar.) Once you start working with your sourdough starter regularly, you can plan out how much starter you need to bake with and then work backwards to determine how much starter you'll need for the first feeding, second feeding, and so forth.
- Use the extra starter to make sourdough pancakes. Click here for an [easy recipe to use extra sourdough starter to make pancakes.](#)

Q. My sourdough starter has grown mold on top or on the sides of the jar. What should I do?

A. While mold is fairly uncommon when working with a sourdough starter, it does occasionally happen and is generally caused by either contamination (soap or food residue are the most common) or weakened yeast (skipped feedings, improper ratios, etc.).

Once your sourdough (or the jar) has developed mold, you have a couple of options. You can either try to save the starter or discard the starter and start over. If you decide to save the starter, please use caution and good judgment as mold may just be infecting the surface of the starter or it may have penetrated the starter.

To try and save the starter, remove the molded portion. With a different (clean) utensil, remove a portion of the sourdough that wasn't near the molded portion. You only need about a tablespoon of starter. Put the small amount of clean starter in a new container (be sure there's no soap or food residue), add equal parts flour and water by weight, or one part starter, one part water, and a little less than two parts flour if using measuring cups. Mix, cover with a towel or loose lid, and allow to

proof. Once proofed (bubbly, rising) or within 12 hours, feed the starter again using the same ratios. Continue feeding the starter over several days watching carefully for any signs of mold. If no mold appears and if the starter looks, smells, and tastes okay, proceed to using it for baking or place it in the refrigerator.

Q. How do I switch a sourdough culture from using white flour to whole wheat flour rye flour, etc.?

A. If you want to feed your sourdough culture with a different type of flour than the one the culture is currently accustomed to, follow these simple steps:

If you have just received your sourdough culture, first get the culture going (feed it a few times) using the flour the culture is accustomed to (white for white-flour starters, rye for rye-flour starters, etc.).

Once the culture is clearly healthy and flourishing, split the sourdough culture in two. Place one half in the fridge and work with the second half. Sometimes there is a bit of a learning curve when switching a sourdough culture to a new type of flour. The half starter in the fridge serves as a backup just in case.

Start feeding the second half of the starter with the new type of flour.

Baking with Sourdough

Q. What is "fresh sourdough starter" that is called for in most recipes?

A. Fresh sourdough starter is a term often used in recipes to refer to recently fed, active sourdough starter. Refrigeration places the sourdough starter in a state of hibernation which allows a starter to go at least a week without being fed, but also yields the yeast temporarily ineffective as a leavening agent. To bring the starter out of cold-induced hibernation and ensure the yeast is active enough to properly leaven bread, the sourdough starter should be fed at least three times to fully activate the yeast prior to using the starter for a baking project.

Start the fresh starter process by removing 1/4 cup of sourdough starter from the refrigerator. (If a liquid layer has developed on top of your starter, pour off the liquid layer first).

If using a kitchen scale: Add flour and water in amounts equal (by weight) to the amount of starter. For example, for 50 grams of sourdough starter, mix in 50 grams of flour and 50 grams of water. The scale method is preferred due to significant differences in flour density.

If using measuring cups: Use this formula: One part sourdough starter to one part water to a little less than two parts flour. For example, if you are starting with 1/4 cup of starter from the refrigerator, mix in 1/4 cup water and a scant 1/2 cup flour.

Cover and allow the mixture to sit for 4 to 12 hours until it has “proofed.” (The amount of time will depend primarily on the nature of the specific sourdough starter and room temperature.) Sourdough that has proofed becomes light and bubbly. The gas created often causes the sourdough starter to expand in size so be sure to use a sufficiently sized jar and set the jar on a paper towel to protect the surrounding surfaces in case the starter bubbles over. If the sourdough does not become bubbly within 12 hours, proceed with the next feeding.

Repeat this process at least two more times. For each feeding use equal amounts of starter, flour and water by weight; or use the measuring cup ratios above. If you make too much sourdough starter during this process, prior to the next feeding some starter can be discarded or set aside to make [sourdough pancakes](#).

If at any point during this process a liquid layer develops on the sourdough starter, pour off the liquid layer prior to the next feeding. The liquid layer is generally a sign the starter needs to be fed more often so feedings should be moved closer together (i.e., feed the starter every 8 hours instead of 12 hours, etc.).

Once the starter has been fed for at least three cycles and is bubbling reliably within several hours of being fed, measure out the portion needed for the recipe.

Be sure to add some of the extra fresh starter back to your master sourdough starter in the refrigerator. This process feeds the sourdough starter for the week.

Q. How do I make truly sour-tasting bread?

A. All our sourdough cultures can be used to make truly sour baked goods. To a certain extent, making very sour sourdough bread is a bit of an art form and requires some practice, but there are a few things you can do to help the process along. First, either keep your sourdough starter on the counter, instead of the refrigerator, or allow for more feeding cycles between removing the starter from the refrigerator and baking with it. Second, allow for a long proofing period. A rise of 12 to 24 hours will generally allow the dough to ferment further and yield a more sour sourdough. Despite the long process (usually over the course of 2 to 3 days) the results are well worth the effort. [Click here](#) for more information on this process and how to make truly sour bread.

Q. How can I make my sourdough starter less sour?

A. Sourdough doesn't have to be sour! A few tips for keeping your sourdough baked goods from tasting sour:

- Don't skip feedings. Sourdough that isn't fed regularly will become too acidic and often taste more sour, but not in a good way!
 - Use a shorter proofing period. Allow the dough to rise only as long as it needs to (generally 4 to 12 hours). Longer rise (proofing) periods, such as 12 to 24 hours, encourage the dough to ferment which will yield a more sour flavor.
-

Q. How do I make bread that is light and fluffy (not small and dense)?

A. The key to making light and fluffy sourdough bread is a long rise time (generally 4 to 24 hours depending on temperature, environmental conditions, your exact sourdough culture and the level of sourness you desire). [Click here](#) for more information on making a light and fluffy sourdough bread.

Q. Are there any tips for getting sourdough bread to rise well?

A. There are generally three factors that contribute to a good sourdough proofing session: active yeast, adequate kneading, and time.

- Be sure your starter is fully active before baking. If your sourdough starter has been stored in the refrigerator, it has been living in a dormant state. Plan to feed the culture three times 8 to 12 hours apart (2 to 4 hours for brown rice starter) prior to baking.
- Knead your dough well to activate the gluten. It is very important to allow the gluten to fully develop so thorough kneading is a critical step. If you are kneading by hand, plan for a minimum of 20 minutes. (You can take breaks though, such as kneading for 5 to 10 minutes at a time.) If you are using a mixer to knead, check the dough often to ensure it's not overheating (which can damage the yeast) and stop the process once the gluten is well-developed. While there isn't any danger of over-kneading when kneading by hand, mixers can abuse the dough if not watched. Regardless of your kneading method, to determine whether the gluten is adequately developed, perform the "window pane test." Take a piece of dough and stretch it between your fingers. If the gluten is well developed, the dough should stretch thin, so you can see light through it, without the dough breaking. If it breaks before it can be stretched thin, keep kneading.
- Plan for a long proofing (rise) period. Because it contains a natural yeast, sourdough tends to take significantly longer to rise than bread made with commercial yeast. Each starter is a bit different (and to a certain extent it will depend on conditions in your home such as room temperature) so until you have determined the best rise period for your particular starter, plan for a 4- to 12-hour rise period. (If you are hoping for more sour bread, plan for 12 to 24 hours.)

Q. Can I use a bread machine to make sourdough bread?

A. It's fairly uncommon to use a bread machine to make traditional sourdough bread because most bread machines have too short a rise cycle. The machines are meant to accommodate commercial yeast which rises much faster than sourdough. Commercial yeast bread will normally rise in 1 to 2

hours while sourdough generally takes 3 to 12 hours to rise depending on the specific culture. If your machine allows you to adjust the rise cycle timing though, it can work.

Q. Can I use my sourdough starter to bake anything besides bread?

A. Absolutely! Sourdough starter is incredibly versatile and can be used to bake cookies, cakes, muffins, flat breads, English-style muffins, and much more.

Q. How do I take a break from feeding my sourdough starter?

A. There are several ways to preserve your sourdough culture if you are unable to feed it weekly for a period of time:

Occasionally you can skip a week feeding your starter without adverse effects. We do recommend avoiding this option unless it's absolutely necessary. If you do plan to store your starter in the refrigerator for more than a week, be sure the starter is freshly fed, and place it (with a lid) in the back of the fridge where it tends to be colder.

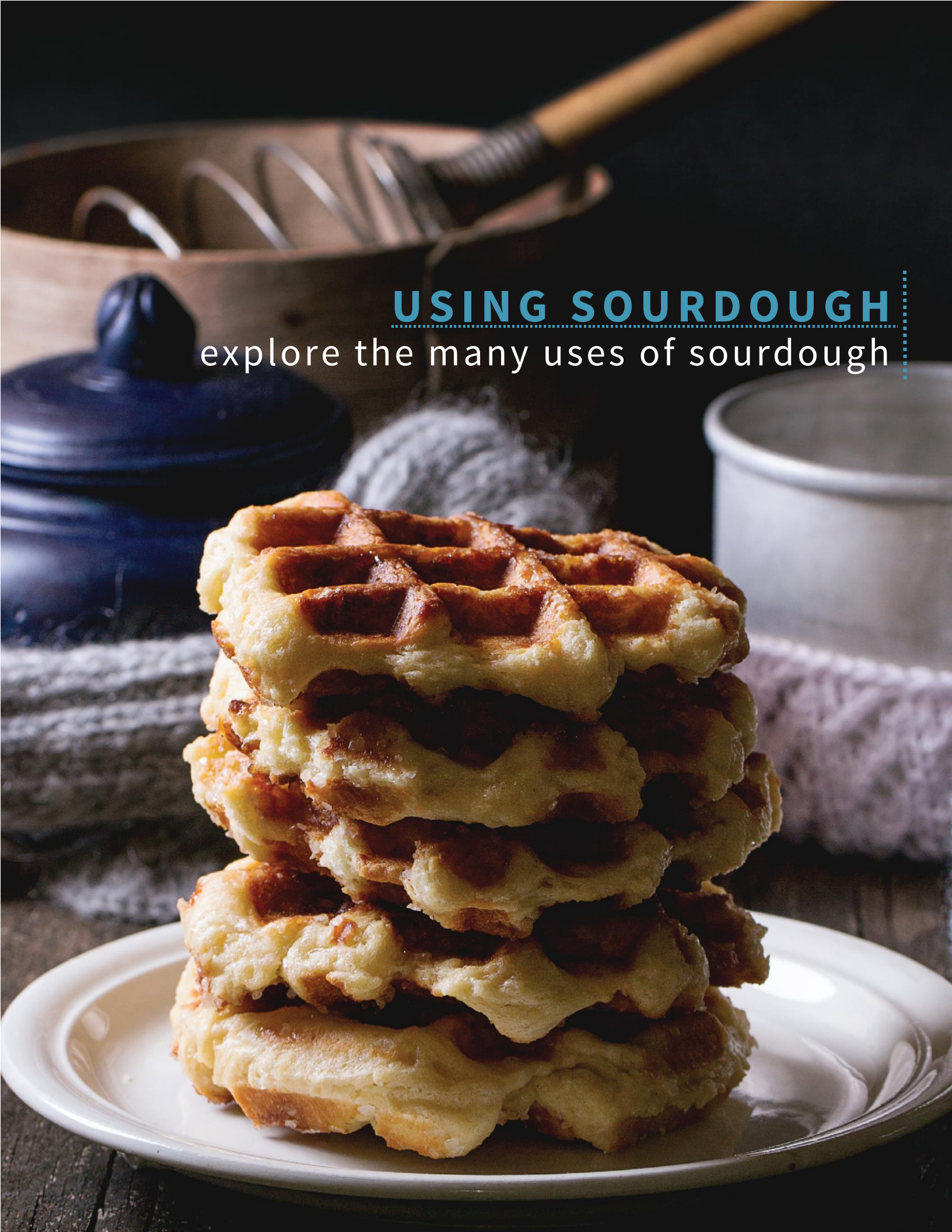
For longer-term storage you can freeze a small amount of starter culture.

If you wish to put your sourdough on hold for longer than 30 days, we recommend drying the culture. Simply spread a portion of sourdough on a piece of unbleached parchment paper and allow to dry in a warm room (up to 85°F) for 3 to 7 days until no moisture remains. Once it's completely dry, place the culture in a zipper-style bag and store in a cool dry place or the refrigerator. Dried sourdough starter will generally keep for at least a few months and often much longer. To rehydrate your culture, just follow the instructions that came with your packet or click here to view our [sourdough starter instructions](#).

Brown rice sourdough starter must be fed every few days and the starter will not survive long term in the refrigerator without feeding. If it becomes necessary to put the starter on hold for more than a few days, use the instructions for drying the sourdough starter.

Q. I love working with my sourdough starter but I'm worried one of these days I'm going to mess up and kill it. Is there a way for me to save some as a back-up in case this happens?

A. Sometimes bad things happen and keeping a backup culture is a good idea. To make a backup sourdough starter, simply spread a small amount of starter on a piece of unbleached parchment paper and allow it to dry in a safe warm spot (up to 85°F) for 3 to 7 days until no moisture remains. Once it's completely dry, place the starter in a zipper-style bag and store in a cool dry spot or the refrigerator. Dried starter will generally keep for at least a few months and often much longer. To reactivate the dried starter, follow the instructions that came with your packet or [click here to view our sourdough starter instructions.](#)



USING SOURDOUGH

explore the many uses of sourdough

Making Sourdough Fit Your Life

Maintaining a sourdough starter can sometimes feel like adding an additional family member. Remembering to feed it regularly and allowing for adequate rising times may seem burdensome, but it doesn't have to. Here are some suggestions for making sourdough fit your schedule instead of ruling your life.



Letting a starter go too long without being fed or refreshed can cause it to take on an undesirable flavor that is hard to get rid of, especially if it is a whole-grain flour starter, like spelt or whole wheat. While it may be ideal to maintain your culture regularly, life happens. You may go on an extended vacation, get too busy to tend to your starter, or just get tired of baking every week. A good option for these instances is to mix a dry starter.

Making a Dry Starter:

- Remove 6 ounces (about 2/3 cup) from a fresh, active culture. Place this starter in a medium-size bowl and add 2 cups of flour. If you are working with a whole wheat starter, use whole wheat flour; add unbleached white flour to a white flour starter. Work the flour into the starter, using your hands if necessary, until the mixture resembles coarse breadcrumbs. Add additional flour if needed to get the correct consistency. This “dry” starter can now be placed in a zipper-style plastic bag or a glass jar with a lid and stored in the refrigerator for up to a month. (It is possible to store a dried starter for even longer before it becomes acidic enough to kill the culture.)

- About 48 hours before you are ready to bake again, remove the starter from the refrigerator and place the crumbs in a medium-size bowl. Add 1 cup of lukewarm water and stir. Cover loosely and let sit out at room temperature for about 30 minutes to absorb the water. Stir again, adding additional water or flour to make the starter look more like it did before it was dried. Resume the normal feeding schedule, adding equal proportions of starter, flour, and water by weight. If you are using cup measurements, add 1 part water and a scant 2 parts flour to 1 part starter. Repeat feeding the culture two more times, about 8 hours apart, for a total of three feedings. (Don't worry if it goes 10 or 12 hours between feedings; it will still work.) Your starter is now fresh and ready to bake with.

Once you have used the fresh starter to mix your bread dough you'll need to allow adequate time for it to rise (proof) before baking. Most sourdoughs benefit from at least an 8-hour rise time. You can adjust this time upward or downward depending on how sour you like the bread (see article on [Manipulating the Sourness of Sourdough](#)), the percentage of starter culture used in the dough, and the ambient rise temperature. While only one rise is essential, often it is easier to refrigerate the dough after mixing it, allowing it to have one slow, cool rise and another warmer rise at room temperature right before you are ready to bake. Rather than having to stop whatever you are doing to tend to your bread dough, you can shape it, give it the second quick rise at room temperature, and bake it when it fits your schedule.

Another option is to let the dough rise for about an hour before shaping into loaves, then put the loaves in the refrigerator to rise slowly, again baking at your convenience. If the refrigerated loaves seem to have risen too much, just reshape them and let them rise again. Dough that is over-risen will often flatten in the baking process and have a crumbly texture. To determine if the dough has over-risen, press your finger into the side of the loaf. If the loaf starts to deflate it has risen too long and will benefit by being reshaped. Once you have baked a few over-risen loaves you'll have a good eye for what the loaf should look like. You should bake the bread within 24 hours of the initial mixing, but you don't have to be tethered to the kitchen the whole time, afraid of letting the dough rise too long.

Many sourdough recipes can be proofed in the refrigerator, freeing you up to bake when it is convenient. Some doughs can even be mixed, proofed, and then frozen to be baked at a later date. ([Sourdough Rosemary Cracker dough](#) works especially well with this technique.) Don't be afraid to

experiment with your sourdough recipes to find which ones are the most flexible. Most of all, don't let your sourdough starter intimidate you! It's really quite forgiving.

Ten Uses for Stale Sourdough Bread

One of the great things about making bread with sourdough starter is that it seems to keep longer than store-bought bread. Some also claim that the flavors evolve even after it bakes, a nod to the bacteria, acids, and yeasts that continue to do their work in your bread loaf.

Eventually, though, time and environment will take their toll on your loaf of homemade sourdough bread. In times past food was not and could not be wasted. Little scraps of vegetables made their way into the stock pot. Leftover soup was added to and simmered until the next meal. And stale bread was used economically in tasty and interesting ways.



Let no crumb of your naturally fermented sourdough bread go wasted with these recipes:

Refreshed Stale Bread. If you are still interested in reviving that loaf for serving with butter then you can try to revive it.

- *The Oven Method.* Splash some water over the top of your bread, just enough to make it slightly damp. Place the loaf in a 250°F oven for 5 to 10 minutes. Watch it closely and remove it when warm. Too long in the oven and you'll get dried-out toast.
- *The Microwave Method.* Place a damp towel around the bread and place it on a microwave-safe dish. Microwave on high for 10 seconds. Check that the loaf is warm and soft; if not, then repeat.

Panzanella. This is an Italian bread salad that utilizes stale bread as an ingredient in an otherwise fairly ordinary salad. The dried-out bread is perfect for sopping up the flavorful ingredients and dressing in the salad, giving you a flavorful, fresh way to use up that stale sourdough.

Cut the stale bread into 1/2-inch cubes and toss into a large bowl. Add vegetables like greens, tomatoes, cucumbers, and olives. Then add other flavorful ingredients like chunks of cheese or salami, fruit, or nuts. Finally, dress the whole thing in an olive oil and vinegar dressing with plenty of garlic, salt, and pepper. Allow the flavors to meld for at least 20 minutes before serving.

French Toast. This familiar breakfast favorite is made even better when stale bread is used. The dried-out bread soaks up the custard mixture and any flavors added to it. Try adding vanilla, cinnamon, nutmeg, or citrus zest for a fun addition to your breakfast.

Bread Pudding. Much like a baked French toast, bread pudding can be made savory or sweet. The basic premise is to make a flavorful custard mixture using eggs and milk and tasty additions. (Think cinnamon, raisins, bourbon, vanilla, and chocolate for a sweet bread pudding; and garlic, onions, mushrooms, vegetables, meats, and cheese for a savory bread pudding.) The dry bread soaks up this rich, flavorful custard and bakes into a delicious meal.



Breakfast Strata. While a bread pudding gives you big bites of flavorful bread when bitten into, a strata uses bread as more of an accompaniment to the eggs it contains. [A strata](#) is made by taking stale bread and putting it into the bottom of a casserole. Then an egg-heavy mixture that most likely contains cheese, vegetables, and other flavorings is poured over these bread cubes. The bread acts as

a lovely complement to the eggs and flavorings and stretches expensive ingredients like eggs, cheese, and meats.

Croutons. These crunchy additions to salads and soups are made by simply coating cubes of dry bread in butter or olive oil and baking. The stale bread soaks up all the flavor of the fat and any additional ingredients, like garlic or parmesan cheese, and becomes rich, crunchy, and delicious. Using sourdough bread adds a depth of flavor to croutons that yeast-leavened white bread just cannot produce.

Bread Crumbs. Once your bread is dry enough you can grind it up to make homemade bread crumbs. If it isn't quite dry enough for your liking you could put it in a low oven or even lay it out in the hot summer sun on a very dry day. Grind it in a food processor to make homemade sourdough bread crumbs.

Piedras or Stones. Using ground up bread crumbs from your stale sourdough plus a bit of flour and other ingredients you can make a scone-like traditional Mexican treat called a piedra, or stone. These are much like a scone or a sweet biscuit in texture and flavor and can be flavored with just about anything: berries, spices, cheeses, etc.

Bavarian Bread Dumplings. These savory dumplings, called Semmelknodel, are like small dumplings of stuffing with ingredients like eggs and milk to bind the day-old bread to vegetables and herbs. Try them with your traditional sourdough for a Bavarian delight.

Feed it to the chickens or pig! If there is food that your family can't or won't eat for some reason, the livestock will love it. You can also feed it to your compost pile, or to the birds that hang around your yard or the park.

Whichever way you choose to recycle your stale sourdough bread, you can know that, much like our foremothers, you made the most of all that you had.

Beyond the Loaf: The Many Uses of Sourdough

The nutritious, tangy, and delightfully flavored loaves of bread are reason enough to keep a sourdough culture in your kitchen. But there's much more sourdough starter can be used for besides bread.

Many of the quick breads, normally leavened with baking soda and baking powder, can use sourdough starter as part of the leavening, perhaps in combination with a bit of baking soda. The acidity of the sourdough culture will react with the baking soda to create the rise we normally find in these baked goods. The bonus is that the sourdough will help to break down the anti-nutrients in the process!



Pancakes

It has been said that the pioneers survived on sourdoughed wheat, most likely in the form of pancakes. As they stopped along the trail on their way out west they would cook over an open fire, most likely with their sourdough starter and sack of flour at their side.

Try [these sourdough pancakes](#) for an overnight recipe where you can add your sourdough starter to flour and water. Or, if you'd like to skip the overnight step try these [delicious fluffy sourdough pancakes](#) that you can make in a large cast-iron skillet.

Tortillas

Almost everyone loves the convenience and flavor of tortillas. You can stuff them with just about anything, but the store-bought varieties often include unwanted additives, or have been sitting on the shelf for days or even weeks. Try these [homemade sourdough tortillas](#) as a fresh, healthy, homemade alternative.

Crackers

Buttery, crunchy, and salty: everything you are looking for in a cracker. The [homemade version](#) is even better when made with your sourdough culture.

Cake

Many people aren't aware that sourdough can lend itself to the sweet as well as the savory. The tang of sourdough can actually play up the sweet flavors often found in cakes and other sweets. Try this [sourdough chocolate cake](#), or this [sourdough applesauce cake](#).

Muffins

Muffins make an excellent addition to breakfasts or can stand alone as a quick snack. Making them with sourdough can create a tender muffin without the need for store-bought buttermilk.

Try these [basic sourdough spelt muffins](#), which utilize both the acidic sourdough culture and baking soda as leavening agents. Alternatively, use sourdough as the stand-alone leavening with these [design-your-own sourdough muffins](#).

Pie Crust

Your favorite pie crust can now be made with the addition of sourdough starter to make it easier to digest in this [sourdough pie crust recipe](#).

Other (Random) Uses for Your Starter



When you have too much starter to use in the above recipes or are simply aren't up to baking then you might consider using your "throw-away" portion of the starter for these things:

- **Feeding the chickens.** Chickens love grain and the sourdough starter, with its yeasts and other organisms, is great food for your feathered friends.
- **Souring other whole grains.** Many people have used sourdough to help in the fermentation of other whole grains, from oatmeal to brown rice. Add a few tablespoons of sourdough to the grains covered in water, mix, and allow to sit out at room temperature until they have reached the desired sourness, from 12 to 48 hours. Cook up and enjoy!
- **Growing your compost.** If all else fails, don't throw it in the trash! Add your extra starter to the compost heap instead.

RECIPES

over 35 ways to use sourdough today



BREADS

Basic Sourdough Bread



This recipe can be used to make a basic loaf of sandwich bread or artisan-style bread.

Ingredients:

- 2-1/3 cups [fresh sourdough starter](#)
- 3-1/3 cup flour
- 1 to 1-1/2 cup water (approximate)
- Scant tablespoon salt

Instructions:

1. Mix sourdough starter, flour, and salt together. Use enough water to make bread dough. (A moist dough is preferable to a dry dough.)
2. Knead dough until it passes the “window pane test”: a small piece of dough will stretch between four fingers without breaking, thin enough to allow light to pass through.
3. Shape the dough into a loaf. Place in a pan or proofing basket, or on a board.

4. Cover lightly with a towel and allow the dough to rise for 4 to 24 hours. If desired, a short (4 to 12 hours) proofing period can be used and the dough can be punched down, reshaped and allowed to rise a second time, but a second proofing period is not required.
5. Slice an X shape in the top of the loaf with a very sharp knife or razor blade.
6. Bake at 400°F until the internal temperature reaches 210°F (use a meat thermometer inserted into the bottom or side of the loaf). Bake 30 to 60 minutes (depending on loaf size). Allow the bread to cool before slicing.

Sourdough Banana Bread



Ingredients:

- 1/2 cup butter, palm shortening, or coconut oil
- 1 cup Sugar
- 1 Egg
- 1 cup [fresh sourdough starter](#)
- 2 bananas, mashed
- 1 teaspoon vanilla extract
- 2 cups flour
- 1 teaspoon salt
- 1/2 teaspoon baking soda

Note: Depending on the hydration level of your sourdough starter, a little more or less flour may be needed to achieve the right consistency in your banana bread batter.

Instructions:

1. Cream together the butter (or shortening or coconut oil), sugar, egg, and vanilla. Mix in the sourdough starter and mashed bananas.
2. In a separate bowl combine the flour, salt, and baking soda. Add the flour mixture to banana mixture and mix just until combined. Do not over-mix.

3. Pour the batter into a greased 9"x5" bread pan. Bake at 350°F for 1 hour or until a toothpick inserted into the center of the loaf comes out clean. Cool completely prior to slicing.

Sourdough Pizza Bread



This is almost as good as having a pizza and it makes a great snack with a slice of cheese melted over thick slices of the bread. This is the “hurry-up” version, but the overnight-rise method is included at the end of the recipe. You can make it with unbleached white flour, whole wheat, or a combination of flours. Unbleached white flour will yield the lightest loaf, while 100% whole wheat flour will produce a dense, chewy loaf.

Ingredients:

- 3/4 cup warm water (about 110°F)
- 1 teaspoon active dry yeast
- 1 cup fresh, thick [sourdough starter](#)
- 1 tablespoon honey
- 1 teaspoon salt
- 1 egg, beaten
- 2 tablespoons [butter](#), melted
- 1/2 teaspoon garlic powder
- 1/2 teaspoon dried oregano, crushed
- 1 teaspoon dried Italian seasoning, crushed
- 1/4 cup freshly grated parmesan cheese
- 3 tablespoons tomato paste

- 1/2 cup finely diced pepperoni, if desired
- 2 to 3 cups unbleached flour, whole wheat, or blend of both

Instructions:

1. Stir honey into warm water in a small bowl; sprinkle yeast over and set aside for 5 minutes, until yeast is foamy.
2. Put sourdough starter in the bowl of a stand mixer (or if you are mixing by hand use a large mixing bowl). Sprinkle salt, garlic powder, and herbs over the top; mix briefly. Add egg, melted butter, parmesan cheese, tomato paste, and pepperoni (if using); mix together well.
3. Add flour, 1/2 cup at a time, until dough pulls away from the sides of the bowl and has an elastic texture. With a heavy-duty mixer this will take about 8 minutes. By hand it may take 10 to 15 minutes. Place the dough into a large greased bowl and cover with a cotton towel or plastic wrap. Let rise about 1 hour, until dough has doubled. Punch down and turn out dough onto a clean surface.
4. Shape into a loaf and place in a greased 9x5-inch loaf pan. Cover loosely and let rise in a warm place until doubled, about 45 minutes. Bake in a preheated 375°F oven for 30 minutes or until golden brown and loaf sounds hollow when thumped on the bottom.

Long-rise method:

1. For a long-rise loaf mix 1/4 cup water with sourdough starter and stir in herbs and 2 to 3 cups flour, until dough is very thick. Cover loosely and let sit overnight at room temperature. It does not have to be in a warm spot unless your house is extremely cold.
2. When ready to bake, sprinkle yeast over 1/2 cup warm water in a small bowl with honey added and set aside for 5 minutes. Blend tomato paste with melted butter and parmesan cheese. Blend into sourdough mixture, using a heavy duty mixer or by hand. Make sure it gets thoroughly incorporated. Stir in additional unbleached flour only if needed to get the proper consistency. Stir in pepperoni after all other ingredients are mixed in.
3. Proceed with kneading, rising, shaping, and baking as above. This method works best if you are using all whole wheat flour.

Sourdough Sprouted Corn Flour Bread



A perfect accompaniment for hearty beans and stews on cold winter days.

Ingredients:

- 1 cup [fresh sourdough starter](#)
- 1 cup whole milk, cultured buttermilk, or coconut milk
- 3/4 cup organic [sprouted corn flour](#)
- 3/4 cup organic [sprouted wheat flour](#)
- 1/2 teaspoon baking soda
- 1/2 teaspoon baking powder
- 1 teaspoon salt
- 2 tablespoons grade B maple syrup
- 2 eggs
- 1/4 cup melted butter or ghee

Instructions:

1. Combine sprouted flours, salt, baking powder, and baking soda in a large bowl.
2. In another bowl combine sourdough starter, milk, eggs, and maple syrup.

3. Stir well, add melted butter, and stir again.
4. Pour wet ingredients over dry and mix just until thoroughly moistened.
5. Pour batter into a 2-quart buttered glass baking dish.
6. Bake at 400°F for 20 to 25 minutes, until golden brown and a toothpick inserted in center of bread comes out clean.
7. Serve piping hot with fresh cultured butter and honey.

Note: If you do not have access to sprouted flours you can use regular wheat flour in place of the sprouted wheat flour and organic masa harina in place of the sprouted corn flour. Soak the flour and masa overnight in the buttermilk then combine with remaining ingredients in the morning.

BISCUITS & CRACKERS

Long-fermented Sourdough Biscuits



Biscuits are part of the culture for many of those who grew up in the south. And while many today avoid white flour, this sourdough biscuit recipe adds the benefits of sourdough, making that white flour just a little healthier for you.

The difficulty in combining the concept of biscuits with that of sourdough is that to rise and ferment, sourdough needs a long period of time in a warm environment. Biscuits, on the other hand, require cold fat in order to create the flaky, lovely layers we know and love.

This recipe combines the two methods here with one special trick: use lard or tallow as your fat for the best biscuits possible. The higher saturation of these fats keeps the fat more solid during the warm fermentation period, and allows it to firm up quickly during the cool period.

These biscuits are just a bit different than the usual baking powder biscuits in flavor and texture, but close enough that you'll be reminiscing about sweet tea and the smell of magnolias over your steaming biscuits topped with butter.

Ingredients:

- 1/2 cup [sourdough starter](#)
- 1 cup milk or cultured milk (yogurt, kefir, buttermilk)
- 2-1/2 cups all-purpose flour
- 1/2 cup cold lard or butter, cut into small chunks
- 1 tablespoon sweetener
- 3/4 teaspoon salt
- 1 teaspoon baking powder
- 1/2 teaspoon baking soda

Instructions:

1. At least 7 hours before you wish to bake the biscuits, prepare the dough for a long fermentation. Start by cutting the fat into the flour until it is in small pieces. Stir in the starter, sweetener, and milk until a soft dough just comes together. Cover and place in a warm spot in your kitchen for 7 to 12 hours.
2. Preheat oven to 400°F. When ready to begin baking, combine salt, baking powder, and baking soda in a very small bowl until evenly mixed. Sprinkle this over the fermented dough and knead until it comes together into a cohesive, soft mass.
3. Roll the dough out to 1/2 inch thick. Cut with 2- to 3-inch biscuit cutter and place the biscuits in a 10-inch oven-proof skillet, one next to another.
4. Place the skillet in the hot oven and bake 20 to 30 minutes, or until golden brown on the top and bottom. Serve hot with butter or drippings.

Sourdough Bacon, Rosemary, and Cracked Peppercorn Crackers



Sourdough, bacon fat, rosemary... what's not to love?

Ingredients:

- 1-1/2 cups [fresh sourdough starter](#), preferably white or wheat flour starter
- 3/4 teaspoon salt, preferably Celtic sea salt or similar high-quality salt
- 1 tablespoon fresh rosemary, finely chopped
- 1 teaspoon peppercorns, coarsely cracked
- 6 tablespoons room-temperature bacon fat, or similar fat (something semi-solid at room temperature)
- 1-1/2 cups whole wheat flour or [sprouted wheat flour](#), preferably freshly ground and sifted to remove some of the bran before measuring

Instructions:

1. Place the sourdough starter in a medium-size non-reactive bowl that has a lid. Stir in salt, rosemary, pepper, and bacon fat until thoroughly blended.

2. Add sifted whole wheat flour to the starter mixture. Use your hands to mix it in well. Knead the dough briefly right in the bowl. Cover and let proof at room temperature about 8 hours or overnight.
3. When ready to bake, divide the dough in three pieces. Roll out each piece of dough on a piece of parchment paper or an 11.5x16.5-inch silicon baking mat. There is enough fat in the dough to keep the rolling pin from sticking. Be sure the dough is rolled as thin as possible.
4. Score the dough in 2-inch squares, using a rolling pizza cutter or a sharp knife. Prick each square with the tines of a fork to keep the dough from puffing up as it bakes. Sprinkle the dough with additional sea salt (and pepper if desired), pressing it lightly into the dough with the palm of your hand.
5. Slide the silicon mat or parchment paper onto a baking sheet. Bake in a preheated 350°F oven (325°F for convection) for about 15 minutes, checking frequently after 10 minutes to make sure crackers are not getting too brown. You may need to remove the outer rows of crackers before the center rows are fully baked, as the entire tray of dough does not always bake evenly. Crackers should be a nice golden brown, not dark brown, and thoroughly dry to the touch. Cool on a rack, separating any crackers that did not already break apart at the score lines. Store in an air-tight container at room temperature for a week or freeze for longer storage.

Note: This dough can be frozen after it has “proofed” overnight. Defrost for 1 to 2 hours before rolling out and baking as directed above.

Quick Sourdough Biscuits



Ingredients:

- 1-1/2 cups flour (preferably [sprouted flour](#))
- 2 teaspoons baking powder
- 1/2 teaspoons baking soda
- 1/2 teaspoons salt
- 1/4 cup coconut oil or non-hydrogenated palm shortening
- 1 cup [fresh sourdough starter](#)

Instructions:

1. Sift dry ingredients together and cut in coconut oil/shortening.
2. Add the sourdough starter and mix just until blended (do not over-mix!).
3. Place the dough on a floured board and knead lightly.
4. Roll the dough 1/2 inch thick and cut into biscuits (but be efficient with the dough and the number of biscuits cut, because biscuits from the first batch will be tenderer than those made after subsequent rolling of the dough).
5. Place the biscuits on a greased cookie sheet and brush the tops with melted butter. Let rise one hour in a warm place.
6. Bake at 425°F for 20 minutes. Makes a dozen biscuits.

Sourdough Onion-Caraway Sprouted Rye Crackers



Ingredients:

- 1 cup [fresh sourdough starter](#) (rye, wheat, or white)
- 1/3 cup lard, butter, or ghee
- 1 cup [sprouted rye flour](#)
- 1 tablespoon caraway seeds
- 2 teaspoons onion powder
- 1 teaspoon Celtic sea salt

Instructions:

1. Place the sourdough starter in a medium-size non-reactive bowl that has a lid. Stir in salt, caraway seeds, onion powder, and fat of choice until thoroughly blended.
2. Add rye flour to the starter mixture. Use your hands to mix it in well. Knead the dough briefly right in the bowl. Cover and let proof at room temperature about 8 hours or overnight.
3. When ready to bake, divide the dough in two pieces. Roll out each piece of dough on a piece of parchment paper or an 11.5x16.5-inch silicon baking mat. Be sure the dough is rolled as thin as possible.

4. Score the dough in 2-inch squares, using a rolling pizza cutter or a sharp knife. Prick each square with the tines of a fork to keep the dough from puffing up as it bakes. Sprinkle the dough with additional sea salt, pressing it lightly into the dough with the palm of your hand.
5. Slide the silicon mat or parchment paper onto a baking sheet. Bake in a preheated 350°F (325°F for convection) for about 15 minutes, checking frequently after 10 minutes to make sure crackers are not getting too brown. You may need to remove the outer rows of crackers before the center rows are fully baked, as the entire tray of dough does not always bake evenly. Crackers should feel thoroughly dry to the touch. They will continue to crisp up as they cool.
6. Cool on a rack, separating any crackers that did not already break apart at the score lines. Store in an airtight container at room temperature for a week or freeze for longer storage.

Sourdough Refrigerator Biscuits



This recipe makes enough for about 40 biscuits, depending on the size you make them, and the dough lasts up to a week in the refrigerator so you can make fresh biscuits all week with minimal effort.

Ingredients:

- 1 cup [sourdough starter](#) (preferably unbleached, white flour starter)
- 1 teaspoon active dry yeast
- 1/4 cup warm water
- 5-1/2 to 6 cups unbleached flour or sifted whole wheat flour (or any proportion of unbleached flour and whole wheat mixed)
- 1 tablespoon baking powder
- 1 teaspoon baking soda
- 1-1/2 teaspoons salt
- 1 cup cold [butter](#)
- 1 heaping tablespoon honey
- 2 cups [cultured buttermilk](#)

Instructions:

1. Butter a 10-cup glass or plastic container with a tight-fitting lid; set aside.

2. Dissolve yeast in warm water and let sit for 5 minutes.
3. In a large bowl stir together flour, baking powder, baking soda, and salt. Cut in butter with a pastry blender or fork until mixture resembles coarse crumbs.
4. In a medium-size bowl mix together sourdough starter, buttermilk, honey, and yeast mixture. Pour over flour mixture and stir until just mixed. Avoid over-mixing. Turn into prepared container, cover and refrigerate up to one week, using dough as needed.
5. To make biscuits, pinch off about 1/4 cup dough per biscuit. Roll dough out to about 1/2-inch thickness; cut with a 2-inch biscuit cutter. Arrange in a buttered pan with biscuit edges barely touching. Let biscuits rise for 15 to 30 minutes, then brush tops with melted butter. Bake in 400°F oven for 15 to 18 minutes, until golden brown. Serve hot.

Note: If you use mostly whole wheat flour the dough tends to discolor after several days. This does not affect the flavor.

Sourdough Hushpuppies



Hushpuppies are pure Southern comfort food. They go well with fried fish or seafood, but you may like them as a snack all by themselves. For a real treat add a cup of grated cheddar cheese along with the egg.

Ingredients:

- 1-1/2 cups organic cornmeal or sprouted corn flour
- 1 cup fresh [sourdough starter](#)
- 1 egg, beaten
- 1/2 cup finely chopped onion
- 1 teaspoon salt
- 1/2 teaspoon baking soda
- 1 teaspoon honey
- Fat for frying (either coconut oil or lard are good choices)

Instructions:

1. Mix cornmeal and sourdough starter in a large bowl. Cover loosely and let sit 12 hours or overnight at room temperature. If the mixture is too thick to stir add water, a tablespoon at a

time, just until you can stir it. When ready to cook, mix egg, onion, salt and honey into the sourdough mixture. Blend baking soda with 1 teaspoon of water and stir in.

2. Melt fat in a heavy cast-iron Dutch oven or deep fryer. It should be about 3 inches deep, so start with about 3 cups of fat. Heat to 390°F. Drop spoonfuls of batter into hot oil and fry 1 to 3 minutes or until golden brown on all sides. Remove from the fat with a slotted spoon and drain on paper towels. Serve hot.

DESSERTS



When we think of sourdough most of us think of large loaves of artisan-style crusty bread with that ubiquitous sour tang. But sourdough has so many more uses than that, from yeast breads to quick breads, savory to sweet.

One great thing about sourdough is that it doesn't have to be "sour" as most people think. By manipulating a few simple variables such as frequency of feedings and the environment where you keep your sourdough starter, you can create sourdough baked goods with very little tang at all.

Because of this you can create a baked item that tastes much like what you are used to, but using a traditional leavening method that increases the nutritional value of the grain you are using. This can make your sweet treat just a little bit healthier.

Baking desserts with sourdough is fairly straightforward. You can adapt most dessert recipes that you already have to use sourdough starter if you know the hydration level of your starter (100% works well) and if you understand that you can replace the liquid and flour ingredients with the sourdough starter.

So, whether it is cake, cookies, pie, or donuts that you crave; be sure to use your sourdough starter in any of these delicious, traditionally leavened desserts.

Sourdough Chocolate Chip Cookies



Ingredients:

- 1/4 cup butter
- 1/4 cup coconut oil or non-hydrogenated palm shortening
- 1 cup rapadura or Sucanat
- 1 egg
- 1 cup [fresh sourdough starter](#)
- 1 teaspoon vanilla extract
- 3 cups flour
- 1/4 teaspoon baking powder
- 1/4 teaspoon baking soda
- 1/2 teaspoon salt
- 1 to 2 cups organic chocolate chips

Instructions:

1. Preheat oven to 350°F.
2. Cream together butter, coconut oil/shortening, and eggs.
3. Mix in the sourdough starter and vanilla extract.
4. In a separate bowl, combine the dry ingredients.

5. Mix the wet and dry ingredients. (Careful not to over-mix!) Incorporate the chocolate chips.
6. Allow the dough to rest for 15 minutes. Shape the dough into small balls (2 teaspoonfuls per cookie). Flatten and place on a cookie sheet.
7. Bake for 10 to 15 minutes.

Makes approximately 4 dozen small cookies.

Soft Sourdough Cookies



Ingredients:

- 3 cups flour
- 1 teaspoon salt
- 1/2 teaspoon baking powder
- 1/2 teaspoon baking soda
- 1/2 cup butter
- 1-1/2 cups rapadura or Sucanat
- 2 eggs
- 1 teaspoon vanilla extract
- 1 cup [fresh sourdough starter](#)
- 2 tablespoons water

Instructions:

1. Preheat the oven to 375°F.
2. Cream together butter, sugar, eggs, and the vanilla extract. Gently mix in the water and sourdough starter. In a separate bowl, mix together the dry ingredients.
3. Combine the wet and dry ingredients. Allow the dough to rest for 15 minutes.

4. Drop the dough onto a cookie sheet. Sprinkle the cookies with cinnamon and sugar if desired.
Bake for 12 minutes.

Sourdough Applesauce Cake



This cake is sweet enough for dessert, but not too sweet to serve as a breakfast coffee cake. Thick homemade applesauce is preferable, but you may use any applesauce you have on hand.

Ingredients:

- 1/2 cup [butter](#), softened plus additional butter for greasing pan
- 1 cup rapadura or other whole cane sugar
- 2 eggs
- 1 teaspoon vanilla extract
- 1/2 cup [fresh sourdough starter](#)
- 1 cup applesauce
- 1 cup [sprouted grain flour](#) or unbleached white flour
- 1 teaspoon baking powder
- 1/2 teaspoon salt
- 1-1/2 teaspoons ground cinnamon
- 1/2 teaspoon ground nutmeg
- 1/2 cup chopped walnuts or pecans (preferably soaked and dried)
- 1/2 cup raisins

Instructions:

1. Prepare a 9x13-inch glass baking pan by buttering sides and bottom well. Preheat oven to 350°F.
2. In a small bowl, measure dry ingredients together, except nuts and raisins.
3. In a large bowl, beat butter and sugar together until well mixed. Stir in eggs, one at a time. Add vanilla, sourdough starter, and applesauce; mix well.
4. Add flour to sourdough mixture, a little at a time, until thoroughly blended. Stir in nuts and raisins. Pour into prepared pan.
5. Bake for about 45 minutes, until top springs back when pressed lightly or toothpick inserted in center comes out clean.
6. Let cool completely and frost with a cream cheese icing or serve plain.

Easy Cream Cheese Icing:

- 1 cup [cream cheese](#) (or one 8-ounce package)
- 2 tablespoons softened [butter](#)
- 1/4 to 1/3 cup honey

Beat ingredients together and spread on cooled cake.

Sourdough Cinnamon-Pecan Coffee Cake



Ingredients:

- 1/2 cup softened butter
- 3/4 cup honey
- 1 teaspoon vanilla extract
- 3 eggs
- 1/2 cup [sourdough starter](#)
- 1/4 cup milk
- 2 cups [sprouted grain flour](#) (spelt or wheat) or unbleached white flour
- 2 teaspoons baking powder
- 1/2 teaspoon baking soda
- 1/2 teaspoon sea salt
- 1 cup thick [buttermilk](#) or sour cream

Pecan Topping:

- 3/4 cup whole cane sugar (rapadura or Sucanat)
- 1 tablespoon [sprouted grain flour](#) or unbleached white flour
- 1 teaspoon cinnamon
- 1/2 teaspoon nutmeg

- 1/4 cup softened butter
- 1 cup chopped pecans (preferably soaked and dried)

Instructions:

1. Butter a 9x13-inch glass baking dish; set aside. Preheat oven to 350°F.
2. Mix pecan topping ingredients together in a small bowl and set aside.
3. In a larger bowl, stir honey and butter together until well blended. Stir in vanilla, sourdough starter, milk, and eggs.
4. Mix flour, baking soda, baking soda, and salt together in a small bowl.
5. Using an electric hand mixer, stir flour into sourdough mixture alternately with sour cream until the batter is smooth.
6. Pour half of the batter into the prepared pan. Sprinkle with half of the topping. Cover with remaining half of batter and sprinkle remaining topping over top.
7. Bake in preheated oven for 30 minutes until toothpick inserted in center of cake comes out clean. Serve warm or cold, with or without whipped cream.

Chocolate Sourdough Snack Cake



This makes just the right size cake for a small family or when a regular layer cake would be too much. It's similar to a brownie, but more cake-like in texture. You can frost it if you like, but it is delicious just plain. The coffee and cinnamon intensify the chocolate goodness.

Ingredients:

- 1/2 cup butter or coconut oil
- 1 cup unrefined cane sugar
- 1 large, room-temperature egg, preferably pasture-raised
- 1/2 cup fresh sourdough starter
- 2 tablespoons cold, strong coffee (can substitute other liquid)
- 1 teaspoon vanilla extract
- 1 cup flour (unbleached all-purpose or whole wheat pastry flour)
- 1/2 teaspoon baking soda
- 1/2 teaspoon salt
- 1/2 teaspoon cinnamon, optional
- 1/4 cup unsweetened, non-alkalized cocoa powder
- 1/2 cup chopped nuts or naturally sweetened mini chocolate chips

Instructions:

1. Line an 8-inch baking pan with parchment paper; lightly butter, and set aside. Preheat oven to 350°F.
2. Mix unrefined sugar and butter together with a wire whisk or hand blender in a large bowl until sugar is thoroughly incorporated into butter. Beat in egg, vanilla, coffee, and sourdough starter.
3. In a separate bowl, stir together flour, salt, baking soda, cocoa powder, and cinnamon.
4. Blend dry ingredients into wet ingredients just until batter is mixed through, then fold in nuts and/or chocolate chips. Do not over-mix.
5. Pour batter into prepared pan and bake for 30 to 40 minutes, until toothpick inserted in the center comes out clean. Cool on a rack and serve plain or frosted with your favorite chocolate frosting.

Sourdough Brownies



Ingredients:

- 4 ounces baking chocolate
- 1/2 cup hot water
- 1 teaspoon baking soda
- 1 cup butter or coconut oil
- 2 cups sugar
- 2 eggs
- 2 teaspoons vanilla extract
- 1 cup walnuts or pecans, chopped
- 1-1/2 cups flour, sifted
- 1/2 teaspoon salt
- 1-1/2 cups [fresh sourdough starter](#)

Note: Depending on the hydration level of your sourdough starter, a little more or less flour may be needed to achieve a brownie batter consistency.

Instructions:

1. Melt the chocolate in a double boiler. Mix in the hot water and bring the mixture to a boil. Stir in the baking soda until the mixture is foamy. Set aside and allow to cool until lukewarm (it is important the mixture not be too hot).
2. Cream together the butter (or coconut oil) and sugar until fluffy. Add eggs and mix well. Add the vanilla, chocolate mixture, and nuts. Gently add the flour and salt. Finally add the sourdough starter. Mix to combine but do not over-mix!
3. Pour into a greased 9x13-inch pan. Allow the batter to rise in a warm spot (70° to 85°F) for approximately 1/2 hour.
4. Bake brownies at 350°F for 35 to 40 minutes.

Sourdough Pie Crust



Pie crust, flaky, rich, and delicious, gets a nutritional boost through the wonder of the sourdough fermentation process. This pie crust will turn your favorite dessert into something your friends and family will rave about.

Ingredients:

- 2 cups flour
- 1 teaspoon sea salt
- 1 tablespoon sugar
- 1-1/2 cups cold fat, cut into 1/2-inch dice (all butter, or half butter, half lard/tallow)
- Approximately 1 cup [fresh sourdough starter](#)

Instructions:

1. Combine the flour, salt, and sugar in a large bowl. Cut in the fat using a pastry cutter or your fingertips. The dough will eventually look like it has “peas” in it.
2. Gradually pour the starter in, a little bit at a time, until it just comes together. Depending on the humidity and the water content of your fat this may be less or more than 1 cup.
3. Once dough barely comes together gather it up in the bowl into a cohesive mass and cover it with plastic wrap or a plate. Leave it in a warm place for at least 7 hours to culture.

4. After the seven hours is up, or when you are ready to use your pie crust, transfer it to a freezer or refrigerator. This is crucial, as having cold fat in the dough will aid in creating a flaky pie crust.
5. Once the crust is very cold you can remove it, roll it out, and bake it into a pie with your favorite fillings.

Makes a top and bottom crust.

GLUTEN-FREE

Gluten-free Sourdough Bread Recipe



Ingredients:

- 1/2 cup fresh [brown rice sourdough starter](#) (see step 1 of the instructions below)
- 1 cup organic brown rice flour
- 1 cup potato starch
- 1/3 cup + 1 tablespoon buckwheat flour
- 1/3 cup + 1 tablespoon millet flour
- 1/3 cup + 1 tablespoon sorghum flour
- 1 cup lukewarm water
- 3 eggs
- 1 tablespoon molasses
- 1-1/2 tablespoons organic sugar, raw honey, or maple syrup
- 1 teaspoon salt
- 4 tablespoons coconut oil, olive oil, or sunflower oil

Instructions:

1. Prepare the fresh sourdough starter: 8 to 12 hours before making bread, remove 1/2 cup of your brown rice sourdough starter from the refrigerator. Mix in 1/2 cup organic brown rice flour and 1/2 cup filtered water. Allow the sourdough starter to sit covered for 8 to 12 hours at room temperature (68° to 75°F). Use 1/2 cup of this fresh sourdough starter for the bread recipe and mix the remaining fresh starter back into the master sourdough starter in the fridge. This will feed your master sourdough starter for the week.
2. Allow the eggs to come to room temperature.
3. Melt the coconut oil and add it to the warm water and molasses. Be sure the mixture isn't hot: it should be lukewarm.
4. Mix the flours (you should have approximately 3-1/4 cups flour total) with the salt.
5. If using a dry sugar (e.g., granulated sugar) add the sugar to the flour/salt mixture. If using a liquid sugar (e.g., honey, maple syrup), add the sugar to the oil/water/molasses mixture.
6. Whisk the eggs in a separate bowl and then add them to the oil/water/molasses mixture.
7. Mix the brown rice flour sourdough starter into the oil/water/molasses mixture.
8. Add the liquid mixture to the dry mixture in parts. Add a little, stir, add a little more, stir until all the liquid mixture is incorporated into the dry mixture. Be sure to mix very well.
9. Grease your bread pan. (Coconut oil works well for this.) Pour the dough mixture into the bread pan. Be sure not to overfill the pan.
10. Allow the dough to rise in a warm location (a bit warmer than room temperature if possible). Keep in mind that dough made with sourdough as the leavening agent will rise more slowly than dough made with commercial yeast. Allow 4+ hours for the dough to rise. (For the first hour or two it may not seem like the dough is rising.)
11. Preheat your oven to 350°F. Bake the bread for approximately 40 minutes.
12. Remove the bread from the oven and from the pan. Cool upside down on a wire rack for at least an hour.

Basic Gluten-free, Dairy-free Sourdough Muffins



This is a basic gluten-free sourdough muffin that you can experiment with. Because there is no gluten present in the flour there is no danger of over-mixing, as there is with wheat-based muffins.

These also do not need dairy products to turn out well, so if you are in need of a dairy-free recipe, use water or a non-dairy milk for the liquid. Experiment with all kinds of flavors and enjoy; without a speck of gluten!

Ingredients:

- 2 cups [gluten-free sourdough starter](#)
- 2 cups brown rice flour
- 1 cup arrowroot starch
- 1 cup water (or milk if not dairy-free)
- 1/2 teaspoon salt
- 1-1/2 teaspoons baking soda
- 1/2 cup sweetener
- 2 eggs
- 1/2 cup melted butter
- 1/2 cup add-ins such as nuts, fruits, etc.

Instructions:

1. 7 to 12 hours before you wish to bake the muffins combine the starter, brown rice flour, arrowroot starch, and water in a medium bowl. Cover and allow to ferment in a warm place overnight.
2. When ready to bake, preheat oven to 425°F. In a medium-size bowl combine egg, sweetener, melted butter, and salt. Whisk to combine.
3. Sprinkle baking soda evenly over fermented dough. Sprinkle over fruits or nuts, if using. Gradually pour liquid ingredients onto dough as you begin to stir in the baking soda. Stir just until combined.
4. Scoop batter into muffin pan until cups are approximately 3/4 full. Bake in pre-heated oven for approximately 20 minutes, or until golden brown and cooked through.
5. Serve with butter, jam, or nut butter.

Easy Overnight Gluten-free Sourdough Waffles



Ingredients:

- 1 cup fresh thick [brown rice starter](#)
- 1 cup [sprouted rice flour](#) or gluten-free oat flour
- 3/4 cup water
- 2 tablespoons maple syrup
- 1/2 teaspoon aluminum-free baking powder (not essential, but does make waffles lighter)
- 1 teaspoon salt
- 2 eggs
- 3 tablespoons melted butter or coconut oil
- 1 tablespoon gluten-free vanilla extract
- 1/2 teaspoon baking soda
- 1 teaspoon water

Instructions:

1. Mix sourdough starter, 3/4 cup water, and rice (or oat) flour together and cover loosely. Let sit at room temperature overnight. Mixture will be very thick and bubbly in the morning.

2. In the morning add maple syrup, salt, baking powder (if using), eggs, vanilla, and melted butter to the starter mixture. Stir together until thoroughly combined. Dissolve baking soda in the teaspoon of water and stir into batter. Do not stir any more at this point. Ladle onto a hot waffle iron that has been brushed with coconut oil and cook until desired crispness. Makes about 8 to 9 waffles.
3. These waffles freeze well. Keep a supply in your freezer for quick weekday breakfasts. Just reheat in a toaster or toaster oven.

Gluten-free Sourdough Chili-Cheese Muffins



These gluten-free muffins are rich in the flavor department, thanks to the addition of chopped green chilies and pepper jack cheese. Try them alongside your favorite chili or any other Southwestern main dish. You may want to double the recipe because they will get gobbled up quickly.

Ingredients:

- 1/2 cup fresh [brown rice sourdough starter](#)
- 1/2 cup [cultured buttermilk](#)
- 1 cup corn flour or [sprouted corn flour](#)
- 1 egg
- 1 teaspoon salt
- 1 teaspoon baking soda
- 3 tablespoons butter, melted
- 2 tablespoons grade B maple syrup, (or honey)
- 1 (4-ounce) can diced green chilies, drained
- 1 cup grated pepper jack cheese

Instructions:

1. In a large bowl, mix together brown rice starter, buttermilk, and egg. Stir in melted butter and maple syrup. Add corn flour, salt, and baking soda. Stir to combine. Fold in cheese and chilies.
2. Spoon batter into 12 lined muffin cups. Bake at 375°F for 15 to 20 minutes, until tops spring back when touched and are golden brown. Serve hot or warm with additional butter.

Gluten-free Lemon-Blueberry Sourdough Pancakes



If you don't tell, no one will know these pancakes are both gluten-free and dairy-free. They also have no added starches or gums, like many of the prepared pancake mixes. You can use different kinds of gluten-free flours: rice, sorghum, millet, oat, or a blend of flours if you like. Be sure to start this recipe the night before you want to use it since the flours should soak overnight. The soaked flour mixture will be very thick before adding in the rest of the ingredients. If it is not very thick the batter will be too runny by the end of mixing.

Ingredients:

- 1 cup fresh, active [brown rice sourdough starter](#)
- 1 cup water
- 1-1/2 cups gluten-free flour of your choice
- 2 large pastured eggs (or 3 small eggs)
- Finely grated zest of 1 large lemon or 2 small lemons
- 1 tablespoon gluten-free vanilla extract
- 2 tablespoons raw honey
- 3 tablespoons coconut oil or butter, melted
- 1 teaspoon salt
- 1 teaspoon baking powder
- 1/2 teaspoon baking soda mixed with 1 teaspoon water

- 1-1/2 cup fresh or frozen wild blueberries (the small size of the wild berries makes for better distribution through the batter)
- Additional coconut oil for griddle

Instructions:

1. Mix brown rice starter, water, and oat flour together in a large bowl. Cover loosely and let sit overnight in a warm spot. (On top of the refrigerator or in a cupboard near a heat source are good options.)
2. In the morning stir in eggs, lemon zest, honey, vanilla, coconut oil (or butter), baking powder, and salt. Blend together thoroughly. Stir in baking soda mixture.
3. Spoon onto a hot, greased griddle (about 350°F) and scatter about 1-1/2 tablespoons of berries over each pancake. Cook until bubbles break on the surface (about 2 minutes). Turn and cook an additional 1 to 2 minutes, until golden brown. Serve hot with honey-lemon syrup, lemon curd, or fermented blueberry sauce.

Makes 20 to 24 pancakes.

Gluten-free Sourdough Buckwheat Pancakes



These pancakes are perfect for those who are gluten-free and want to eat whole-grain foods that are easily digested. A dash of cinnamon plays nicely off of the nutty flavor of the buckwheat.

Ingredients:

- 1-1/4 cups whole-grain buckwheat flour
- 1 cup milk or cultured milk such as [yogurt](#), [kefir](#), or [cultured buttermilk](#)
- 1/2 cup [gluten-free sourdough starter](#) (or any sourdough starter if you don't need gluten-free)
- 2 eggs, lightly beaten
- 1/2 teaspoon salt
- 3/4 teaspoon baking soda
- 1 teaspoon ground cinnamon
- [butter](#) for frying

Instructions:

1. Combine flour, milk, and starter in a medium-sized bowl the night before you wish to cook the pancakes.
2. In the morning beat eggs in a small bowl. Sprinkle salt, baking soda, and cinnamon over the flour-milk-starter mixture.

3. Slowly pour beaten eggs into fermented dough with dry ingredients sprinkled over until just combined.
4. Fry in 1/4 cup increments on a hot, greased griddle until bubbles form and the edges begin to set up. Flip and finish cooking 2 to 3 more minutes.

Versatile Gluten-free Sourdough Flat Breads with a Formed Pan



Hamburger bun pans, also called muffin-top pans, are a great way to make sandwich-size gluten-free sourdough flatbreads. Using a brown rice sourdough starter, you can make dough that does not contain any xanthan or guar gums typically used in gluten-free products. Because there is no gluten to yield an elastic texture, the dough will be thin and pourable, more like a cake batter than traditional bread dough. The recipe is simple, but does require a little forethought since you will need to refresh the brown rice starter the night before you use it.

Ingredients:

- 1/2 cup brown rice starter
- 1/2 cup water
- 3/4 to 1 cup brown rice flour or other gluten-free flour
- 1 large egg (if your eggs are on the small side use 1 egg and 1 egg white)
- 1/2 teaspoon sea salt
- 1 tablespoon olive oil or melted butter
- 1 tablespoon chopped fresh herbs (if desired)
- Ghee, coconut oil, or lard for greasing pan

Instructions:

1. Mix together the starter, water, and flour, adding enough flour to make a very thick mixture that resembles wet concrete. Cover loosely, and let sit at room temperature overnight or up to 24 hours. The starter should be very bubbly when you use it. There may be a layer of thinner liquid at the bottom, so stir that into the starter before removing what you need. Measure out 1 cup and return the remaining starter to your starter jar.
2. Add the egg, sea salt, olive oil or butter, and fresh herbs to the cup of fresh starter. Stir well.
3. Prepare the pan by greasing each mold with a liberal amount of ghee, coconut oil, or lard. Sprinkle a pinch of brown rice flour in the bottom of each mold to help prevent sticking. Alternatively, you can cut parchment rounds to fit the bottom. These parchment pieces can be used several times before discarding. Each pan has 6 molds, and this recipe makes enough batter for 8, so you will need to either use 2 pans or plan to bake a smaller second batch after the first batch bakes.
4. Place no more than 2 tablespoons of batter each mold. Shake the pan a little to distribute the batter evenly over the surface. Bake in a preheated 350°F for 5 to 6 minutes, until dry to the touch, but not crispy. Remove from the oven and let cool in the pan to help make removing easier, unless you have used parchment.
5. Flatbreads can be used for lunch sandwiches, as an accompaniment to main dishes to soak up sauces, for breakfast sandwiches (try egg, bacon, and cheese), or for mini pizzas. Use your imagination and you'll probably find many more uses for these versatile little breads. Vary the herbs according to how you will be using the breads, or leave them out entirely.

Gluten-free Sourdough Oat English Muffins



These English muffins have a nice sour tang and are full of “nooks and crannies” to hold your favorite toppings. If you use the oven technique they will have a dome that you can trim off for the characteristic flat shape. They can also be cooked in the traditional way — on a griddle — but you will need to finish them in the oven to make sure they cook thoroughly without the surfaces getting too dark. Because they are made without any gums or additional starches they will be a bit more crumbly than traditional wheat muffins. Toast them and top them with a slice of organic ham, a pastured poached egg, and some [enzyme-rich Hollandaise sauce](#) for a nutrient-dense breakfast fit for a king.

Ingredients:

- 1-1/2 cups freshly prepared [brown rice sourdough starter](#)
- 1 cup water
- 2 cups gluten-free oat flour (or other gluten-free flour of your choice)
- 1 egg
- 1/4 cup butter (softened) or lard
- 1 teaspoon baking powder
- 1 teaspoon salt
- 1/2 teaspoon baking soda

Instructions:

1. Mix brown rice starter, water, and oat flour together. Cover loosely and let sit at room temperature 4 to 6 hours or overnight.
2. When ready to cook, stir in butter, egg, baking powder, baking soda, and salt. Batter will be thick, but spreadable.
3. Oven technique: Place six large (4-inch diameter) buttered English muffin rings on a baking sheet lined with parchment paper. Spread batter in rings, filling about 2/3 full. Bake at 350°F for 20 to 25 minutes. Remove from oven, loosen muffins from rings, and cool on a wire rack. Split each muffin in half and toast.
4. Griddle technique: Place six large (4-inch diameter) buttered English muffin rings on a griddle heated to 275°F (low). Cook 10 minutes, until top is barely set and bottom surface is nicely browned. Flip over and cook an additional 10 minutes. Remove muffins from rings and transfer to a 300°F oven for 10 more minutes to cook through completely. Let cool before splitting in half.

Note: These are best served fresh within a day or so of when they are made. As with many gluten-free products, the texture becomes crumbly the longer they age, especially if they have been frozen first.

Gluten-free Sourdough Pizza Crust



Makes enough for one 12-inch pizza. Double the recipe if using an 11x17-inch sheet pan. You can use a combination of your favorite gluten-free flours or use all brown rice flour. The trick is to mix the brown rice starter very thick, almost like concrete.

Ingredients:

- 1 cup fresh *very thick* [brown rice starter](#)
- 1 tablespoon olive oil
- 1 large egg
- 1/2 teaspoon salt
- 1 teaspoon dried oregano or fresh chopped rosemary, optional

Instructions:

1. If you are using a pizza stone be sure it has been preheated.
2. Line a rimmed 12-inch pizza pan with parchment paper cut to fit.
3. Mix ingredients together and pour into pan. The dough will be more like cake batter than bread dough.
4. Bake in a 375°F oven for 5 to 7 minutes, until set, but not brown. Remove to a rack and peel off parchment.

5. Place crust on a new piece of parchment and top with sauce, cheese, and other toppings. You can use a peel to place pizza directly onto a hot pizza stone, or you can return the pizza to the pan.
6. Bake at 450°F until cheese melts.

Note: It works very well to bake “mini” crusts in a hamburger bun pan. These can be topped with your favorite toppings and baked before freezing for quick grab-and-go lunches.

MAIN DISHES USING SOURDOUGH

Rye Sourdough Noodles



Pasta is one of the most frequently made meals in America. Those who have turned to more traditional food preparations, such as sourdough and sprouted grains, they have all but said adios to this beloved grain dish.

Fortunately noodles have been made for thousands of years in various forms and the sourdough noodle is nothing new. This rustic grain dish provides the base for a flavorful sauce or as an addition to soups and stews.

The souring process makes breaks down the fiber and anti-nutrients in the grain and the egg yolks in this recipe make a more tender noodle.

Ingredients:

- 1 cup [rye sourdough starter](#)
- 2 egg yolks
- 1/2 cup water
- 3 cups rye flour or more as necessary

Instructions:

1. In a medium-size bowl, combine sourdough starter, egg yolks, and water. Whisk well to combine.
2. Slowly mix in flour until a stiff dough can be formed into a ball. You may use more or less flour, depending on the humidity in the environment and the hydration of your starter.
3. Knead the dough for 5 to 10 minutes or until smooth. Cover tightly with a lid or plastic wrap and allow to sit at room temperature for at least 8 hours.
4. After the rest period divide the dough into quarters. Take each quarter and roll it out with a rolling pin or a pasta machine. If using a rolling pin roll as thinly as possible.
5. Once rolled out cut your pasta into long thick strands. Repeat with the other three portions of dough.
6. To cook, drop noodles into boiling, heavily salted water and let cook for 3 to 5 minutes or until they float. Serve with your favorite sauce.

Sourdough Pizza Crust Recipe



Ingredients:

- 1-1/2 cups [fresh sourdough starter](#) *
- 4 to 5 tablespoons olive oil, coconut oil, etc.
- 1 teaspoon salt
- 1-1/4 to 1-3/4 cups flour

Instructions:

Preheat the oven to 500°F. Mix together the fresh sourdough starter, one tablespoon of oil, the salt and 1-1/4 cups of flour. Add more flour, a little at a time, as needed to form a pizza dough consistency. The amount of flour needed will depend on the hydration level of your sourdough starter (i.e., the flour-to-water ratios used when feeding the starter). Allow the dough to rest for 30 minutes as it will be easier to roll out. (It won't rise significantly, if at all.) Roll the dough out into a circle using a minimum amount of flour to prevent sticking. Bake the crust for approximately 7 minutes. Remove the crust from the oven and brush on the remaining oil to prevent the toppings from soaking into the crust and making it soggy. Add the desired toppings and bake the pizza until the crust browns and the cheese melts.

*We recommend using sourdough starter that has been fed three times 4 to 12 hours apart prior to making the pizza crust. Click here for more information on [feeding your sourdough starter prior to baking](#).

Sourdough Skillet Tamale Pie



This is quick-to-go-together, economical, and filling main dish using ingredients that are easy to keep on hand for those days when you just don't have time to think about preparing something complicated. It can be made gluten-free if you use a [brown rice starter](#) instead of a traditional wheat starter. Be sure your sourdough starter is fresh, though.

Ingredients:

- 1 pound ground beef
- 1 medium onion, chopped
- 1 clove garlic, crushed
- 1 medium bell pepper, chopped
- 1 (14-ounce) can organic diced tomatoes
- 2 tablespoons tomato paste
- 1 cup frozen (defrosted) or canned organic corn,
- 1/2 cup sliced olives
- 1 teaspoon sea salt
- 1 teaspoon ground cumin
- 1 teaspoon (or more) chili powder
- 1/2 cup [fresh sourdough starter](#) (regular or gluten-free)
- 1 cup [sprouted corn flour](#) (can use regular cornmeal instead)

- 1/2 cup cultured buttermilk (you can substitute kefir or yogurt)
- 2 eggs
- 1/2 teaspoon baking soda
- 1/2 teaspoon sea salt
- 1 to 2 cups grated cheddar or pepper jack cheese

Instructions:

1. Brown ground beef and onion a large cast iron skillet (12-inch size). Stir in chopped bell pepper, tomatoes, garlic, corn, olives, salt, cumin, chili powder, and tomato paste. Bring to a boil; reduce heat, cover, and let simmer 10 minutes.
2. Meanwhile, mix sourdough starter, corn flour, buttermilk, salt, and baking soda together. Pour over the hot meat mixture and sprinkle with grated cheese.
3. Place the skillet in a 350°F oven for about 45 minutes, until cornbread topping is solid and cheese is golden brown. This can also be made in a 9x13--inch glass baking dish if desired. Just transfer the meat mixture to the baking pan before pouring the topping over. Leftovers, if any, can be frozen.

MUFFINS



So you've been making beautiful loaves of sourdough bread for quite some time now. They are hot, fresh, tangy, and delicious, right? But you want something a little different; something a little lighter, a little sweeter, a little more hand-held perhaps.

What you're looking for is some good sourdough muffin recipes. You can use your sourdough starter to make some delicious naturally leavened muffins with all sorts of flavor combinations.

Serve them up for a snack, for breakfast (alongside a kefir smoothie, of course), or as a sweet treat slathered with butter and jam.

How to Make Sourdough Muffins

Sourdough muffins, like any quick bread, are reliant not on yeasts for their rise, but on a chemical reaction between alkaline and acidic ingredients. This chemical reaction produces carbon dioxide which creates the risen baked good.

Sourdough muffins therefore rely on the sourdough starter as the acidic element in this chemical reaction. When combined with baking soda, which is alkaline, you will get a light and fluffy muffin.

Some muffins can also be made without the use of baking soda. If you wish to rely solely on your sourdough starter for leavening then you must start the batter 12 hours before you wish to bake so that they have a chance to rise.

If you are looking for a tried and true sourdough muffin recipe with a variety of different flavors, then try some of the following recipes. You may wish to dabble in making your own variation of the sourdough muffin, depending on what you have on hand.

Basic Sourdough Muffins



What could be better on a cold morning than a warm-from-the-oven sourdough muffin? Use this basic recipe as a canvas for various flavorings from fruit, nuts, or even chocolate chips.

Ingredients:

- 1/2 cup [sourdough starter](#)
- 1-1/2 cups whole wheat flour
- 1/2 cup melted [butter](#)
- 2 eggs
- 1 teaspoon salt
- 1 teaspoon soda
- 1/2 cup Sugar (evaporated cane juice, Sucanat, or a similar dry sweetener)
- 1/2 cup add-ins such as fruit or nuts (optional)

Ingredients:

1. The night before gently mix together starter and flour until just combined. Allow to ferment for 8 to 12 hours.
2. In the morning, preheat the oven to 375 degrees and whisk in all other ingredients, being careful not to mix too much.

3. Fill greased muffin tins 3/4 full with batter and bake in pre-heated oven for 30 minutes or until golden brown.

Sourdough Banana Muffins



Sweet, spicy, and with just a hint of tang from the sourdough, these muffins bake up as the perfect breakfast accompaniment or afternoon treat.

As an added bonus to those who need it, they are also dairy-free.

Ingredients:

- 1 cup [sourdough starter](#)
- 1 cup flour
- 1/2 cup sugar
- 1 cup mashed bananas
- 1 egg
- 1/2 teaspoon salt
- 1/2 teaspoon baking soda
- 1 teaspoon baking powder
- 1 teaspoon cinnamon

Instructions:

1. At least 12 hours before you wish to bake them, combine sourdough starter and flour. It will make a very thick dough, so do not be alarmed. Cover and place in a warm spot to culture for 12 to 24 hours.
2. After 12 to 24 hours, preheat oven to 375°F. Combine sugar, banana, and egg in a small bowl. In another small bowl combine salt, baking soda, baking powder, and cinnamon.
3. Sprinkle the dry ingredients over the cultured dough. Gradually add the liquid ingredients, stirring just to combine.
4. Spoon batter into muffin tin, filling 3/4 full. Bake at 375°F for 18 to 20 minutes, or until a toothpick comes out clean.

Sourdough Honey-sweetened Blueberry Spelt Muffins



Just sweet enough and studded with blueberries, these sourdough spelt muffins are delicious! Spread them with butter warm out of the oven for a breakfast treat or pack them away in school lunches for a wholesome snack.

Ingredients:

- 2 cups spelt flour
- 1/2 cup [sourdough starter](#)
- 1 cup kefir, buttermilk, or milk
- 1/2 cup honey
- 3/4 teaspoon salt
- 2 large eggs, beaten
- 1/4 cup melted butter, coconut oil, or lard
- 3/4 teaspoon baking soda
- 1-1/2 teaspoons baking powder
- 2 cups fresh blueberries

Instructions:

1. 7 to 12 hours before you wish to bake the muffins combine the flour, starter, and milk until just combined. Cover and leave in a warm place to ferment for 7 to 12 hours.

2. Once fermentation period is up pre-heat oven to 425°F and combine honey, salt, beaten eggs, and melted fat in a medium bowl. Beat until combined. Sprinkle baking soda and baking powder evenly over fermented dough.
3. Begin to mix in leavening agents while pouring in 1/3 of liquid mixture and dried fruit or nuts, if using. Repeat with second 1/3 of liquid. Sprinkle blueberries over batter and finish with last 1/3 of liquid mixture, mixing just to combine. The dough may be a bit stretchier than you are used to with a quick bread dough because of the fermentation process.
4. Once all ingredients are mixed in thoroughly, divide batter amongst 12 to 16 muffin cups, depending on the size of the cups. Bake in preheated oven for approximately 20 minutes, or until golden brown and puffed up.

Serve with butter, honey, or jam.

Sourdough Apple Butter Muffins



These muffins are sure to be a lunchbox favorite. With whole-grain goodness and a hint of sweetness they make up quickly if you have fresh sourdough starter on hand.

Ingredients:

- 1/2 cup [fresh sourdough starter](#)
- 1/2 cup apple butter, preferably homemade
- 1/2 cup fresh, whole milk or non-dairy alternative
- 1 egg
- 1/4 cup butter or coconut oil, melted
- 1/4 cup honey or grade B maple syrup
- 1-1/2 cups sifted whole wheat flour or sprouted flour
- 2 teaspoons baking powder
- 1/2 teaspoon salt
- 1 teaspoon ground cinnamon
- 1/2 teaspoon ground allspice
- 1/2 cup chopped walnuts or pecans

Instructions:

1. Line 12 to 14 muffin cups with paper liners. Preheat oven to 375°F.
2. Mix sourdough starter, apple butter, and milk in a large bowl. Stir in honey, egg, and melted butter.
3. In a separate bowl stir together flour, baking powder, salt, cinnamon and allspice. Pour over sourdough mixture and stir just until blended. Fold in chopped nuts. Do not over-mix!
4. Fill prepared muffin cups 2/3 full. Bake in preheated oven 20 to 25 minutes, until tops are firm and golden brown. Remove from pan and cool on a wire rack.
5. Serve warm with butter and additional apple butter for spreading. These are best served the same day they are made, but they freeze well for longer storage.

100% Rye Sourdough Pseudo English Muffins



Baking with rye flour poses a few challenges. Rye has gluten, yes, but it also behaves much differently from wheat when it comes into contact with liquid. And stir just a bit too much and you may as well be baking a rye flour paste.

This brings us to why these are called “pseudo” English muffins. The original English muffin is made with wheat, but it does not require additional leavening in the form of the baking soda mentioned in this recipe.

The final texture of these is also just a bit different from the usual English muffin. These have a finer crumb without the large holes that we are familiar with in English muffins.

You’ll still love these for the taste, for the ease, and for the way it makes use of your sourdough starter. This is a great way to use up that half-cup of starter that you might throw away every night when you feed your starter.

Throw it into a bowl with a few other ingredients and you’ll have piping hot English muffins your whole family will love in the morning.

Ingredients:

- 1/2 cup [fresh sourdough starter](#)

- 1-1/2 cups milk
- 2 cups flour
- 1 tablespoon honey
- 1 teaspoon [sea salt](#)
- 1 teaspoon baking soda

Instructions:

1. The night before you wish to serve these, combine the starter, milk, and flour in a medium bowl. Mix until combined, cover, and set in a warm place overnight. In the morning drizzle or sprinkle the honey, salt, and baking soda over the mixture.
2. Stir until just combined.
3. Preheat a griddle or large skillet over medium-low heat. Once the griddle is hot, scoop up enough batter with a wooden spoon to create a 2-inch wide by 3/4-inch high round. Smooth it out with the back of the spoon as needed.
4. Cook over medium-low heat for five minutes, or until golden brown. Flip very gently and cook another five minutes. If you are worried that the muffins are not cooked through you can place them in a 300°F oven for another five minutes.
5. Split carefully with a fork and serve.

Sourdough Oat Bran Muffins



For those interested in a bran muffin with a bit of extra flavor, you like this sourdough bran muffin.

It is packed with low-glycemic bran and with the fermentation process brings out way more flavor, with just a hint of tang.

Ingredients:

- 2 cup [sourdough starter](#)
- 1-1/2 cup wheat or oat bran
- 1/2 cup flour
- 2 eggs
- 1/2 cup melted [butter](#)
- 1/2 cup honey
- 2 teaspoon baking soda
- 1/2 teaspoon salt
- 2 teaspoons cinnamon
- 1/4 teaspoon freshly grated nutmeg
- 1/2 cup raisins (optional)

Instructions:

1. Combine starter, bran, and flour in a medium bowl. It will be a dryer dough than you would expect for muffins. Cover and place in a warm spot for 8 to 12 hours.
2. Once fermentation time is up, preheat oven to 425 degrees and whisk together egg, butter, honey, salt, and spices in a small bowl. Sprinkle baking soda over fermented dough and gradually stir it in along with liquid mixture, one third at a time, adding raisins during last third. Stir just until combined.
3. Divide batter into 12 to 16 muffin cups and bake in pre-heated oven for about 15 minutes, or until golden brown and cooked through.

Spelt Sourdough Muffins



These sourdough muffins are barely sweetened with honey and have just a bit of tang from a long-fermentation period. They are the perfect accompaniment to a supper or lunch of soup or stew; or great as a not-too-sweet muffin breakfast treat.

Mix in whatever it is you like: raisins, nuts, seeds, or even chocolate chips.

Ingredients:

- 2 cups flour
- 1/2 cup [sourdough starter](#)
- 1 cup [kefir](#), [buttermilk](#), or milk
- 1/4 cup honey
- 3/4 teaspoon salt
- 2 large eggs, beaten
- 1/4 cup melted butter, coconut oil, or lard
- 3/4 teaspoon baking soda
- 1-1/2 teaspoons baking powder
- 1/2 cup dried fruit or nuts (optional)

Instructions:

1. 7 to 12 hours before you wish to bake the muffins combine the flour, starter, and milk until just combined. Cover and leave in a warm place to ferment for 7 to 12 hours.
2. Once fermentation period is up pre-heat oven to 425°F. Combine honey, salt, beaten eggs, and melted fat in a medium bowl. Beat until combined. Sprinkle baking soda and baking powder evenly over fermented dough.
3. Begin to mix in leavening agents while pouring in 1/3 of liquid mixture and dried fruit or nuts, if using. Repeat with other 2/3 of mixture, beating well to combine. The dough may be a bit stretchier than you are used to with a quick bread dough because of the fermentation process.
4. Once all ingredients are mixed in thoroughly, divide batter amongst 12 to 16 muffin cups, depending on the size of the cups. Bake in preheated 425°F oven for approximately 20 minutes, or until golden brown and puffed up.
5. Serve with butter, honey, or jam.

Sourdough Pumpkin Chocolate Chip Muffins



With familiar and delicious flavors, these sourdough muffins pack a flavor and nutritional punch. Serve as a fall treat for breakfast along with eggs and apples, or as a school snack with nut butter.

Ingredients:

- 1/2 cup [sourdough starter](#)
- 1 cup cultured milk (yogurt, kefir, or buttermilk)
- 2 cups flour
- 1 teaspoon cinnamon
- 1/2 teaspoons sea salt
- 1/2 teaspoon baking soda
- 1 teaspoon baking powder
- 2 eggs
- 1/4 cup melted butter
- 1/3 cup honey
- 1 15-ounce can pumpkin puree
- 1-1/2 cups chocolate chips

Instructions:

1. At least 12 hours before you wish to bake your muffins, combine sourdough starter, cultured milk, and flour in a medium bowl. Cover and place in a warm place to culture for 12 to 24 hours.
2. Once culturing time is completed, preheat oven to 375°F. Combine cinnamon, sea salt, and leavenings together with a fork in a small bowl.

3. In a separate bowl beat eggs and whisk in butter, honey, and pumpkin puree.
4. Sprinkle dry ingredients over soured dough. Pour in wet ingredients slowly while combining. When almost all of the liquid has been used up, sprinkle the chocolate chips over the batter and stir in with the remaining liquid ingredients.
5. Spoon batter into butter muffin cups until nearly full. Place in preheated oven and bake 20 to 25 minutes or until a toothpick comes out clean. Baking time may be longer, depending on the hydration of your starter and the viscosity of your ingredients.

PANCAKES, WAFFLES, AND FLATBREADS

Sourdough Pancakes Recipe



Making pancakes is a great way to use extra sourdough starter.

Ingredients:

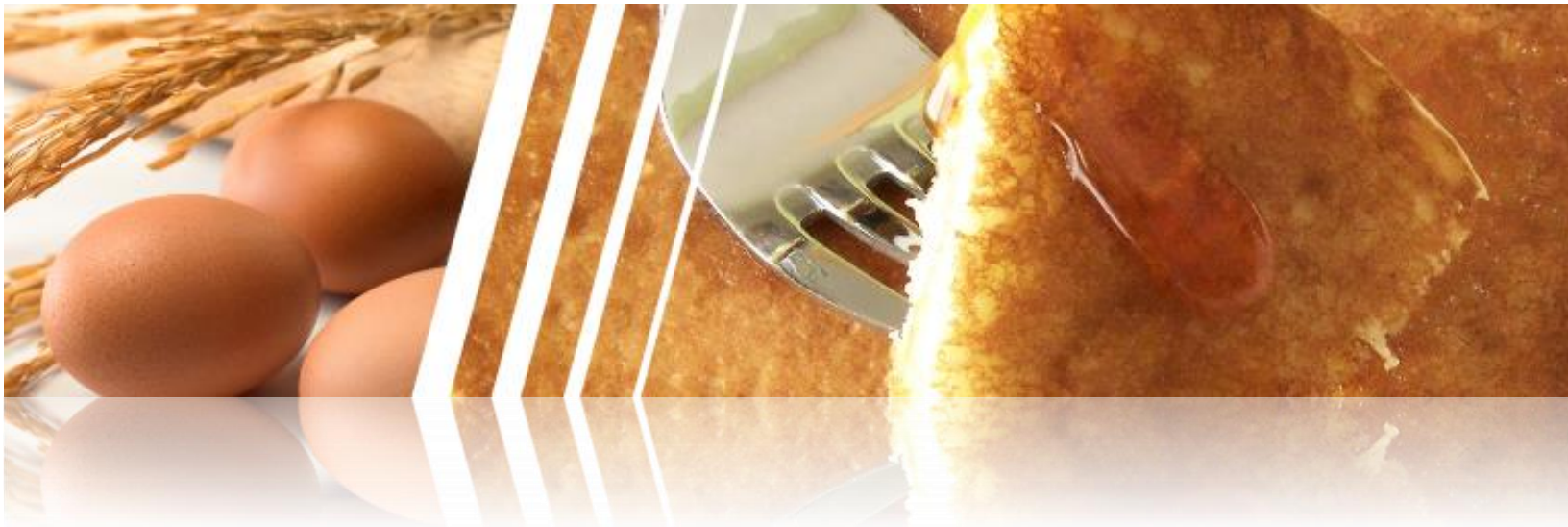
- 2 cups [fresh sourdough starter](#)
- 1 egg
- 3 tablespoons sugar (rapadura, Sucanat, honey, maple syrup, etc.)
- 2 tablespoons oil
- 3+ tablespoons milk, coconut milk, or water (see below)
- 1 teaspoon baking soda (optional, makes the pancakes fluffier)

Instructions:

1. Mix together sourdough starter, egg, sugar, oil and baking soda. Use the milk, coconut milk or water to thin the batter to a pancake batter consistency (how much you will need depends on the consistency of your sourdough starter).

2. Heat a griddle to moderate heat. Melt a slice of butter or coconut oil on the griddle. Once the griddle is hot, use 1/4 cup of batter for each pancake. Cook until golden brown and flip. Cook until golden brown on both sides.

Fluffier Overnight Sourdough Pancakes



You can use sourdough starter straight from the jar for a quick batch of pancakes. They are quick and simple and pretty tasty, and a great way to use up extra starter.

But if you are looking for something a bit fluffier, this recipe for sourdough pancakes does the trick. Any type of grain or starter can be used.

The trick to thicker, fluffier pancakes is simply a thicker batter. Rather than pour it on the griddle, you sort of scoop it out and spread it around. The other trick is to cook it quickly over a higher heat to seal in the edges. Then flip them as soon as bubbles are forming.

Ingredients:

- 1-3/4 cups [sourdough starter](#)
- 1-1/4 cup flour
- 2 eggs, beaten
- 1/2 teaspoon [sea salt](#)
- 1/2 teaspoon baking soda
- 4 tablespoons melted butter plus more for greasing the pan.

Instructions:

1. The night before you wish to make the pancakes, combine the sourdough starter and flour. Mix just to combine, cover, and let sit out overnight.
2. The next morning heat a skillet to medium heat. Stir down the dough if it has risen and add the rest of the ingredients, stirring just to combine. If it seems too thick to spread you can thin it with just a bit of milk.
3. Add a tablespoon of butter, coconut oil, or lard to the skillet and add 1/2 cup batter to the pan, spreading it out with the back of a spoon if needed. Cook just until bubbles begin to form and carefully flip.
4. Cook two more minutes until just done. Repeat with remaining batter, adding butter as needed.

Egg-free Sourdough Pancakes



If you have to avoid eggs because of an allergy or sensitivity, then you might miss those pancakes bound with eggs.

Because sourdough allows the flour and liquid to bind together through the process of fermentation, making egg-free sourdough pancakes is easier than you might expect. This is a simple sourdough pancake recipe using sourdough starter, and the eggs can be removed without any major loss of flavor or texture.

Do keep in mind that the batter will be slightly thicker due to the loss of liquid. This actually works well because the batter doesn't spread as far, allowing you to create fluffy pancakes without the use of eggs.

Also, this will work well with wheat flour because it contains gluten, which helps to bind the pancakes. If using gluten-free sourdough starter, then add 2 teaspoons ground chia or flax seeds and combine with wet ingredients. Allow wet ingredients to rest for 5 to 10 minutes before adding dry ingredients.

Ingredients:

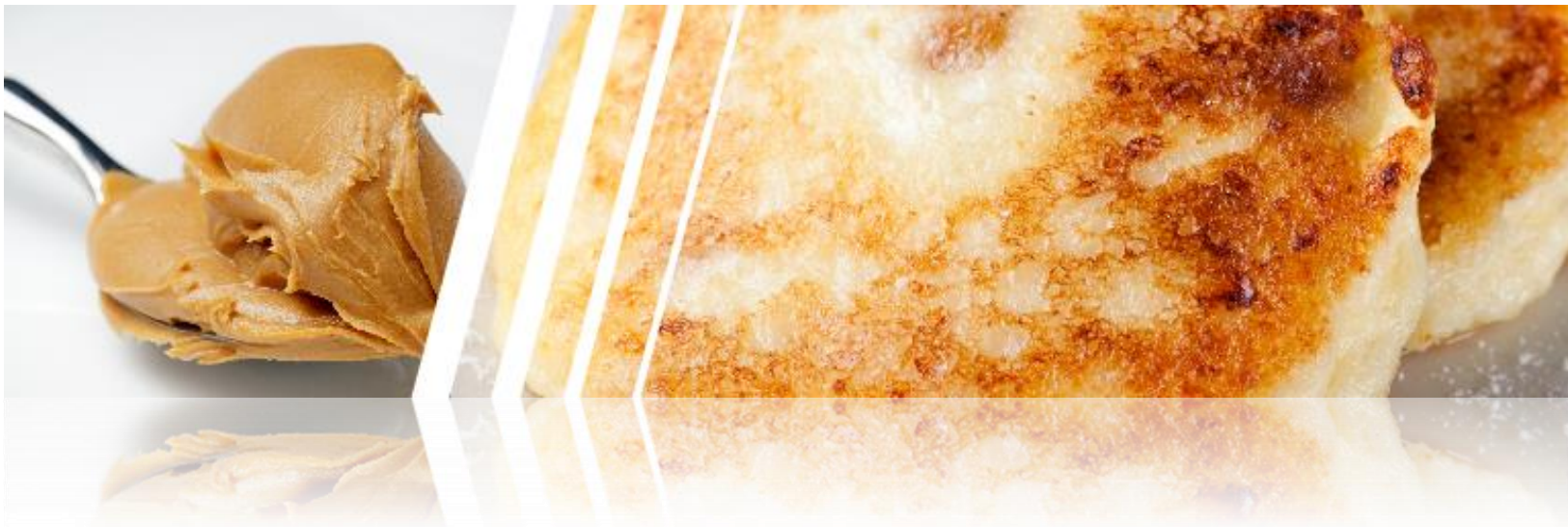
- Generous 2 cups [sourdough starter](#) (100% hydration)
- 2 tablespoons melted butter (that has been cooled)
- 2 tablespoons sweetener (honey, maple syrup, sugar, etc.)

- 1/2 teaspoon salt
- 1/2 teaspoon baking soda
- 1/2 teaspoon baking powder (optional, if you're avoiding it)

Instructions:

1. Whisk together wet ingredients. In a small bowl combine dry ingredients. Add dry to wet and whisk.
2. Cook pancakes on a pre-heated griddle in 1/4-cup increments. Flip as bubbles appear and cook until browned on both sides.

Egg-free Peanut Butter Sourdough Pancakes



Every once and a while it is fun to switch things up just a bit. Adding peanut butter to the batter of your morning pancakes will give it just enough flair to keep your family loving those sourdough surprises.

Serve with butter and jam for that old-fashioned peanut butter and jelly flavor.

These are egg-free and utilize a bit of ground flax to act as a binder. If you do not need an egg-free recipe replace the flax and milk with a beaten egg.

Ingredients:

- 2 cups [sourdough starter](#)
- 1 tablespoon ground flax seeds
- 1/3 cup creamy natural peanut butter
- 1/4 cup milk, or more as needed to thin
- 1/2 teaspoon baking soda
- 1 teaspoon baking powder
- pinch of salt

Instructions:

1. Pour starter in a bowl and mix in flax, peanut butter, and milk. Allow to stand five minutes in order for the flax to hydrate. Add additional milk to reach a pancake batter consistency, if needed.
2. Sprinkle baking soda, baking powder and salt evenly over batter. Whisk just until combined.
3. Pour in 1/4-cup increments onto a hot, greased griddle and cook until bubbles begin to pop and edges firm up. Flip and cook a couple more minutes.
4. Serve with syrup or jam for a peanut butter-jelly combination.

Long-fermented Whole Wheat Sourdough Tortillas



Tortillas are one of those foods you've probably never tried in sourdough form. You might be pleasantly surprised to find that using sourdough is easy, and makes delicious tortillas.

Use these to wrap up your favorite tacos, burritos, or quesadillas. Or layer them with cheese, meat, and beans for a Mexican lasagna.

Ingredients:

- 1/2 cup 100% hydration [sourdough starter](#)
- 1/2 cup milk or water
- 4 tablespoons melted lard, bacon grease, or coconut oil (lard is traditional)
- 1 teaspoon sea salt
- 2 cups (plus more, as needed) whole wheat flour (hard wheat is better than soft as it contains a bit more gluten and holds together better when rolling out)

Instructions:

1. Combine starter, milk, salt, and melted fat in a medium bowl. Stir in flour, 1/2 cup at a time, until you hit two cups.

2. At this point determine whether your dough needs more flour. You are looking for a dough that is slightly sticky, but not so moist that it is messy. You will be kneading on a floured surface so don't add too much flour.
3. Add flour until desired texture is achieved. Plop out onto a floured surface and knead for about three minutes.
4. Cover and place in a warm location in your kitchen for 8 to 24 hours to ferment.
5. When ready to cook tortillas divide dough into eight pieces. Roll each into a small ball and place back into covered bowl. Remove balls from container one at a time and roll them out on a floured work surface until desired thickness is reached.
6. Carefully transfer tortilla to a hot griddle that has been heating over medium-high heat. Cook for about 30 seconds, or until bubbles begin to form and the edges firm up.
7. Flip and finish cooking another 30 seconds.
8. Serve hot or cool and store to eat for a few days. The sourdough helps to keep the tortillas soft and fresh for a longer time than non-sourdough tortillas.

Savory Vegetable-Cheddar Sourdough Pancakes



Sourdough pancakes are popular for breakfast in many homes. Topped with sweet and rich things like butter, honey, or jam, they are a delicious starchy side to homegrown eggs. But for something a little different, a savory pancakes for supper can be fun.

These pancakes, loaded with vegetables and protein, make an exciting and interesting supper. These are not at all similar to the fluffy, cakey pancakes you serve for breakfast. They are not leavened with baking soda and so are more flat and rich, resembling a fritter. Serve them up with a creamy, spicy, zingy sauce to cut the richness and you'll have rave reviews.

Ingredients:

- 2 large carrots
- 1/4 medium head of cabbage
- 1/2 large onion
- 1/2 cup packed grated cheddar cheese
- 3 eggs
- 3 cups active, bubbling [sourdough starter](#) (that has been fed in the past 4 to 6 hours)
- 2 teaspoons salt
- 1/2 teaspoon pepper
- 1 tablespoon garlic powder

- 1 teaspoon smoked paprika powder
- Lard, tallow, or coconut oil for frying

Instructions:

1. In a large bowl beat eggs. Use a box grater to grate carrots, cabbage, onion, and cheese right over eggs. Add salt, pepper, garlic powder, and paprika and mix well.
2. Pour starter over contents of bowl and mix just to combine. Let stand five minutes.
3. Meanwhile, heat a large skillet over medium heat. Add 3 tablespoons of cooking fat and allow to melt and heat up.
4. Once skillet is well-heated, ladle 1/3 cup portions into hot fat to fry pancakes. Fry for 3 to 5 minutes or until they are browned and can flip easily. Cook through on the other side. Serve with salsa, a creamy, tart sauce, and a salad.

Sourdough Crepes



Crepes are one of those foods you either know about and most likely love, or you've never heard of before. They are very popular in France, and can be stuffed with myriad sweet and savory flavors.

Crepes are a thinner, more protein-packed cousin to the pancake. Where pancakes usually contain quite a bit more flour than eggs and milk, crepes are heavier on the egg and milk.

These sourdough crepes are wonderful in that there is no overnight waiting. You simply combine your sourdough starter, eggs, and milk and you've got crepes ready in a flash with all of the benefits of sourdough to boot.

Ingredients:

- 1 cup [sourdough starter](#)
- 3 eggs, beaten
- 2 tablespoons melted [butter](#)
- 1/4 teaspoon salt
- 1/4 to 1/2 cup milk (to thin batter)

Instructions:

1. Heat a 10-inch skillet over medium heat. In a medium-size bowl combine all ingredients, slowly adding milk until the desired (thin) consistency is reached. Add some butter to the skillet once hot.
2. Pour 1/3 cup of the batter into the center of the pan. Pick up the pan and turn and tilt it to allow batter to spread in a circular motion. Cook for about one minute or until edges come away from pan. Flip and cook an additional minute or two.
3. Remove crepe from pan and repeat with remaining batter, adding butter to pan as needed. Serve with jam, berries, whipped cream, or syrup.

Sourdough Dutch Baby Pancake



Also known as the puffy oven pancake, the Dutch baby pancake is a beautiful combination of pancake and custard that puffs beautifully in a hot oven. Cooked in a cast-iron skillet and made with sourdough it makes a beautifully rustic, old-fashioned breakfast.

Because this recipe calls for sourdough starter only, with no addition of flour, it can be whipped up on a whim. There is no need to plan ahead.

With only a few other ingredients you will have your family running to the table for this rich, slightly tart, and slightly sweet puffy pancake.

Ingredients:

- 6 tablespoons butter
- 6 eggs
- 2 cups [sourdough starter](#) (at 100% hydration)
- 1/3 cup milk
- 1/2 teaspoon salt
- 1 tablespoon sugar or honey (optional)

Instructions:

1. Preheat your oven to 425°F. In a medium bowl beat eggs and add sourdough starter, milk, salt, and sugar or honey (if using). Whisk well until smooth.
2. Cut butter into tablespoons and place in a 12-inch cast-iron skillet. Place pan with butter into the hot oven for at least five minutes, or until butter is well-melted and pan is hot. Remove pan from oven, swirl butter around bottom and sides to coat. Quickly pour in batter and place back in oven.
3. Bake for 15 to 18 minutes or until puffed up all the way around. Try not to open the oven door until at least 15 minutes in order to prevent the pancake from not puffing up properly.
4. Serve right away as it will begin to deflate just after removing from the oven. Serve with syrup, powdered sugar, fruit, lemon juice, or any of your favorite toppings.

Sourdough Pumpkin Pancakes Recipe



When leaves color the earth with bright red, orange, and yellow and a crisp bite comes from a passing wind, you know it's time to start baking with pumpkin.

If you've already exhausted the dessert tray with pumpkin pie, pumpkin cake, and pumpkin bars then consider adding some pumpkin to breakfast with these sourdough pancakes.

They are light and fluffy, from the sourdough starter and the baking soda, and have a nice fall flavor to them. Perfect for enjoying with a hot cup of tea on a cool fall morning.

Ingredients:

- 1 cup [sourdough starter](#)
- 1 cup pumpkin puree
- 2 cups water
- 3 cups wheat, spelt, or rye flour
- 2 eggs, beaten
- 1/4 cup maple syrup
- 1/4 cup butter, melted
- 1 teaspoon baking soda
- 1 teaspoon [sea salt](#)

- 2 teaspoons pumpkin pie spice

Instructions:

1. The night before you plan to make the pancakes combine starter, pumpkin puree, water, and flour in a large plastic or glass bowl. Cover and let rest overnight at room temperature.
2. The next morning mix in eggs, maple syrup, melted butter, baking soda, salt and pumpkin pie spices until just combined.
3. Pour onto hot skillet and cook over medium-low heat until bubbles form and edges start to set up. Flip and cook a few more minutes until done.
4. Serve hot with butter, maple syrup, honey, or other sweet toppings.

Sourdough Waffle Recipe



Ingredients:

- 1-1/4 cup flour (more or less, to get the right consistency to the batter)
- 2 teaspoons baking powder
- 1/4 teaspoon baking soda
- 1/2 teaspoon salt
- 1 tablespoon rapadura, Sucanat, honey, or maple syrup
- 1 egg
- 1 cup [fresh sourdough starter](#)
- 1/4 cup coconut oil (melted) or sunflower oil
- 3/4 cup milk (can substitute coconut milk)

Instructions:

1. Preheat waffle iron.
2. In a large bowl, mix the dry ingredients. In a separate bowl beat the egg then mix in the sourdough, oil, and milk.
3. Combine the wet and dry ingredients just until the dry ingredients are moistened. Add flour if necessary to thicken, or milk to thin. Do not over-mix!
4. Pour 1/4 to 1/2 cup of batter on the waffle iron. Cook until golden brown.

Makes about 4 servings.

ROLLS

Multigrain Sourdough Bagels



Ingredients:

- 3/4 cup steel-cut oats
- 1/2 cup millet
- 2 cups warm water
- 2 tablespoons whey, lemon juice, or apple cider vinegar
- 3 tablespoons butter (or other healthy fat)
- 1/4 cup honey
- 1-3/4 cup milk, [kefir](#), or thin [yogurt](#), warmed slightly
- 1/2 cup sunflower seeds
- 2-1/2 cups [fresh spelt or wheat sourdough starter](#)
- 3 to 3-1/2 cups spelt flour (can use regular wheat)
- 2 teaspoons Celtic sea salt

Instructions:

1. Rinse millet; place millet and oats in medium-size bowl. Cover with 2 cups of warm water and stir in whey or other acid. Cover and let stand 8 hours or overnight. Do not drain.
2. In a small saucepan heat milk and butter over low heat just until butter is melted. Stir in honey. Do not boil; just heat gently.
3. Place sourdough starter in a large bowl. Stir in soaked grains, milk mixture, salt, and sunflower seeds. Stir in enough flour to make a stiff dough. Pour out onto a smooth surface and knead, adding more flour if necessary, until dough is elastic. (You can also use a heavy-duty stand mixer for this step.)
4. Shape dough into a ball and place in a buttered bowl. Cover and let rise until doubled, anywhere from 2 to 4 hours or more (may take 8 hours), depending on a lot of variables. You can also refrigerate it at this point and let it rise slowly in the refrigerator for 24 to 48 hours. (Cover with parchment paper, then plastic wrap).
5. When ready to shape and bake, put a large pot of water on to boil. A 5- to 8-quart size works well. Add 1 tablespoon of salt to the water once it reaches a boil. Reduce heat, cover and let simmer until bagels are shaped.
6. Punch the dough down and divide into 16 pieces about the size of large lemons. Roll into balls, using thumbs to “tuck” dough in tightly. Place your index finger in the middle of the ball and make a hole; carefully stretch into a bagel shape.
7. Drop 4 bagels at a time into the pot of simmering salted water. Increase the heat to keep water gently boiling. Wait until they rise to the surface, then use a skimmer or spatula to remove from water. Place on a parchment-lined baking sheet.
8. Brush tops of bagels with egg white wash (1 egg white whisked with 1 tablespoon water). Place in preheated 400°F oven. Bake about 20 to 25 minutes. Check after 20 minutes to make sure they are not getting too brown.

Makes about 16 (4 to 4.5-ounce) bagels.

Note: These freeze very well.

Sourdough Rye Rolls with Cheddar Hearts



Use a traditional sourdough starter to make these delicious dinner rolls with a surprise center.

Ingredients:

- 2 cups [fresh sourdough wheat or rye starter](#)
- 1-1/2 cups cool water
- 3 tablespoons dark molasses
- 2 teaspoons salt
- 2 teaspoons caraway seeds
- 1 cup rye flour
- 2-1/2 to 3 cups whole wheat Flour
- 12 ounces raw sharp cheddar cheese, cut in 1-inch squares
- 1 tablespoon potato or arrowroot starch
- 1/4 cup warm water

Instructions:

1. Mix the fresh sourdough starter with water in a large bowl. Stir in molasses, salt, and caraway seeds. Stir in rye flour and enough of the wheat flour to make a “shaggy” dough. Turn dough out onto a smooth surface.

2. Knead, adding more whole wheat flour as needed, until the dough is smooth and elastic. Place in a buttered bowl, cover with a tea towel, and let rise at room temperature 4-8 hours.
3. Punch dough down, pour out onto a smooth surface, and divide dough into about 12 even pieces. Form each piece of dough into a disk shape, about 4 inches in diameter. Place a square of cheese in the center of the disk, then wrap the dough around the cheese and form into a smooth ball.
4. Place the balls of dough on a parchment-lined baking sheet. Cover with a tea towel and let rise 45 minutes to 1 hour. Meanwhile, preheat oven to 400°F (375°F for convection) and mix the potato starch with 1/4 cup water. (This will be brushed on the rolls.)
5. When rolls have nearly doubled in size, brush the tops with the starch water. Place the baking sheets in the hot oven. Bake for 15 minutes, turn pans 180° halfway through the baking time (to ensure they all bake evenly), and brush rolls with starch water again. Bake another 15 minutes or until nicely browned.
6. Remove from oven and cool on a wire rack. Don't be surprised if some of the cheese melts out of the buns onto the baking sheet. If you like, you can scoop up the melted cheese and stuff it back into the buns where it escaped. These are best eaten the same day they are baked, but they freeze well and can be reheated in a toaster oven to soften their cheese hearts.

Whole Wheat Cinnamon Raisin Rolls



Ingredients:

- 2 cups [fresh sourdough starter](#), either whole wheat, white, or spelt
- 1 cup water, room temperature
- 2 teaspoons salt
- 2 teaspoons cinnamon
- 1/4 cup honey
- 1/2 cup walnut pieces (chop if pieces are very large)
- 1 cup raisins
- 1 cup unbleached white flour
- 3 to 4 cups whole wheat or spelt flour

Instructions:

1. In a large bowl combine starter and water. Stir in honey, salt, 1 cup of unbleached flour, and cinnamon. Fold in raisins and walnuts. Stir in about 2 cups of whole wheat flour (until dough is too thick to mix by hand), then turn out onto a smooth surface and knead, adding additional flour as needed, until dough is elastic, about 10 minutes.

2. Place dough in a buttered container (either glass or plastic). Cover and let rise until doubled. This may take anywhere from 2 to 8 hours, depending on the room temperature. A longer rise time is preferable. You can also refrigerate the dough for up to 24 hours at this point.
3. When doubled, punch down and divide dough into sixteen pieces. Shape each piece into a ball. Place 8 balls of dough onto each of 2 greased baking sheets; cover with a cotton tea towel, and let rise until doubled, about 30 to 45 minutes (longer if dough was refrigerated). When rolls have doubled in size they are ready to bake.
4. Bake in a 400°F oven for 20 minutes, until golden brown. Cool on a wire rack. Makes a great lunchbox snack spread with cream cheese.