



LIFE SCIENCES

Instructor: Mr. Logan Parkison

Mr. Parkison recently graduated Wayne State University and is a self-proclaimed 'licensed nerd'. Mr. Parkison became a teacher because he wanted to share his love of science, its history, and how it can better people's lives.

Today we are going to take a look at the science behind bread; the sourdough starter.

GRANDFRIENDS SOURDOUGH

MAN & YEAST: FACTS:

- Yeast can be considered man's oldest industrial microorganism.
- It's likely that man used yeast before the development of a written language.
- Leaven was a soft, dough-type medium kept from one bread baking session to another.
 - A small portion of this dough was used to start or leaven each new lot of bread dough.

Theory of its Origins: There are two theories for the origins of leavened bread dating back to Antiquity:

1. Egyptian beer was added to in lieu of water, thus introducing yeast into the dough.
2. A piece of dough was forgotten, leavened by ambient yeast and later baked.

INGREDIENTS:

To begin your starter

- 1 cup (113g) whole rye (pumpernickel) or whole wheat flour
- 1/2 cup (113g) cool water

To feed your starter

- scant 1 cup (113g) Unbleached All-Purpose Flour
- 1/2 cup (113g) cool water (if your house is warm), or lukewarm water (if your house is cool)

SCIENCE OF YEAST - FERMENTATION

Yeast in the carbohydrate ridden dough will consume the carbs and give off carbon dioxide gas. This is responsible for leavening of the bread.

Try making your own Sourdough starter!

Day 1: Combine the pumpernickel or whole wheat flour with the cool water in a non-reactive container. Glass, crockery, stainless steel, or food-grade plastic all work fine for this. We recommend at least 1-quart capacity. Stir everything together thoroughly. Cover the container loosely and let the mixture sit at warm room temperature (about 70°F) for 24 hours.

Day 2: You may see no activity at all in the first 24 hours, or you may see a bit of growth or bubbling. Either way, discard half the starter (113 grams, about 1/2 cup), and add to the remainder a scant 1 cup (113 grams) Unbleached All-Purpose Flour, and 1/2 cup (113 grams) cool water (if your house is warm); or lukewarm water (if it's cold). Mix well, cover, and let the mixture rest at room temperature for 24 hours.

Day 3: By the third day, you'll likely see some activity – bubbling; a fresh, fruity aroma, and some evidence of expansion. It's now time to begin two feedings daily, as evenly spaced as your schedule allows. For each feeding, weigh out 113 grams starter; this will be a generous 1/2 cup, once it's thoroughly stirred down. Discard any remaining starter. Add a scant 1 cup (113 grams) Unbleached All-Purpose Flour, and 1/2 cup (113 grams) water to the 113 grams starter. Mix the starter, flour, and water, cover, and let the mixture rest at room temperature for approximately 12 hours before repeating.

Day 4: Weigh out 113 grams starter, and discard any remaining starter. Repeat step #3.

Day 5: Weigh out 113 grams starter, and discard any remaining starter. Repeat step #3. By the end of day #5, the starter should have at least doubled in volume. You'll see lots of bubbles; there may be some little "rivulets" on the surface, full of finer bubbles. Also, the starter should have a tangy aroma – pleasingly acidic, but not overpowering. If your starter hasn't risen much and isn't showing lots of bubbles, repeat discarding and feeding every 12 hours on day 6, and day 7, if necessary – as long as it takes to create a vigorous (risen, bubbly) starter. Once the starter is ready, give it one last feeding. Discard all but 113 grams (a generous 1/2 cup). Feed as usual. Let the starter rest at room temperature for 6 to 8 hours; it should be active, with bubbles breaking the surface.

Remove however much starter you need for your recipe – typically no more than 227 grams, about 1 cup. If your recipe calls for more than 1 cup of starter, give it a couple of feedings without discarding, until you've made enough for your recipe plus 113 grams to keep and feed again. Transfer the remaining 113 grams of starter to its permanent home: a crock, jar, or whatever you'd like to store it in long-term. Feed this reserved starter with 1 scant cup (113 grams) of flour and 1/2 cup (113 grams) water, and let it rest at room temperature for several hours, to get going, before covering it. If you're storing starter in a screw-top jar, screw the top on loosely rather than airtight. Store this starter in the refrigerator, and feed it regularly; we recommend feeding it with a scant 1 cup (113 grams) flour and 1/2 cup (113 grams) water once a week.