

# SOURDOUGH

## Teachers notes

### The microbiology of sourdough

Most bread dough contains yeast which uses sugar to produce carbon dioxide gas. This is what causes the bread to rise as the gas gets caught in pockets of dough. The most common yeast is *Saccharomyces cerevisiae* or “bakers yeast” as it is commonly called. The same species is also used to brew beer.

Sourdough is slightly different. Firstly we don't add any microbes to a sourdough starter, instead, we rely on the microbes naturally present in the flour. This is why whole wheat flour works best as processing and bleaching can kill these microbes.



Sourdough is produced by yeast, but also by bacteria which live together in the sourdough culture. Because the microbial cultures are wild, every batch will be slightly different and so will the microorganisms, which is part of the fun. However, typically there will be a lactic acid bacteria in the mixture such as *Lactobacillus sanfranciscensis* (guess where it was discovered). Lactic acid bacteria ferment to produce lactic acid which makes the dough acidic or “sour”. This would be a problem for normal bakers yeast which doesn't grow well in acidic conditions.

The yeast in sourdough is therefore different and is tolerant to the acid produced by the bacteria. A very common yeast strain found in sourdough is *Candida milleri* (I wonder how this was named?).

In the sourdough, these microbes work together to produce gas and different aromatic chemicals that give sourdough its characteristic smell and flavour.

## THINGS TO CONSIDER

### Cleanliness

When making sourdough, we're actually creating the perfect environment for bacteria and yeast to grow. It is important to make sure that we only grow the bacteria and yeast that we want to be there, and nothing else. This isn't so difficult as whole wheat flour already contains the yeast and bacteria that we need, we just need to make sure that no contamination can find its way into our starter from other sources. To do this, make sure all the containers and utensils that come into contact with the sourdough are clean. It also means that we shouldn't put our hands into the dough or breathe into it. Some of the exercises require that the children smell the dough. During this step, try and encourage them to sniff from the edge of the container without putting their noses in. The dough should smell pleasant, either yeasty or slightly acidic and sour. If there are any off smells or signs of mould, throw the sourdough away and start again.



### Temperature

Sourdough starters grow faster where it is warm. Try to find a place that has a consistent 20 - 25 degrees celsius temperature. Close to a heat source like a radiator, an oven or a boiler. If the temperature is slightly colder, then the sourdough will still grow, just a little more slowly. This means that it might take a little longer than 6 days to be ready to bake and that you might have to wait slightly longer in between feeds.

### When to feed

In the instructions, we say that after the third day, the sourdough starter should be fed twice per day. In reality, this could change a little depending on how well the starter grows. To know when it is time to feed, look at the top of the starter and look for evidence that it is sinking. A sure sign of this is sourdough residue attached to the side of the container above the level of the sourdough starter. This means that the starter is no longer growing and it is time to feed. If you don't see this and the top of the sourdough starter looks slightly curved, it is probably still expanding and it will be better to skip this feeding, or wait a few hours until it begins to sink.



## Liquid

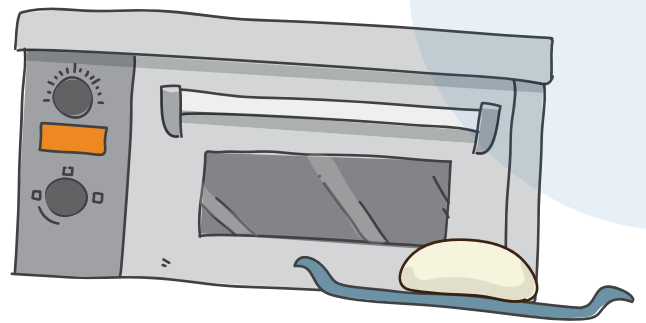
Liquid on top of the sourdough starter is completely normal and is another sign that it needs to be fed.

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## What to do after the sourdough is finished

### Bake!

Now is time to make your sourdough bread, crepes, cakes and muffins.



### Maintain your starter

To maintain the starter so that you can use it again, feed it once per week and keep it refrigerated.

Feed it the day before you plan to use it and make sure that it has doubled in size.