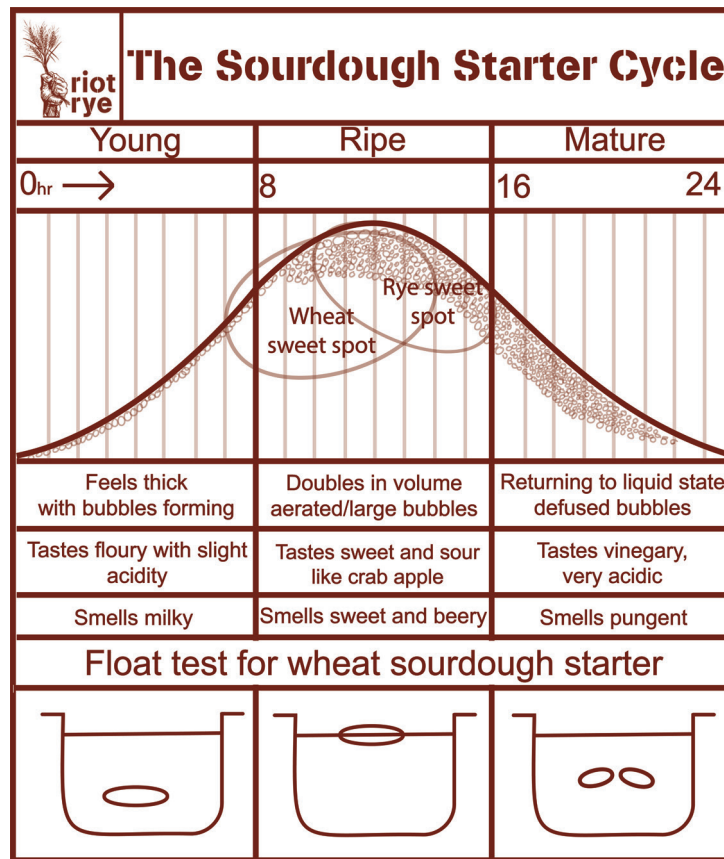


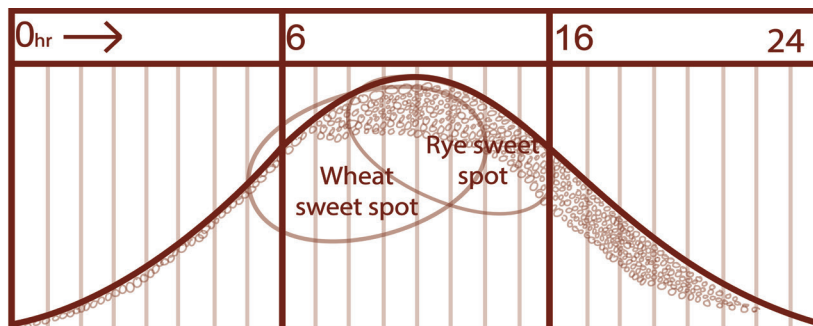
The Sourdough Starter Cycle

© Julie Lockett & Joe Fitzmaurice at Riot Rye

Understanding when, how and why to refresh your starter and build a levain.



This graphic, inspired and adapted from an original post by Adam Veitch of Doughies in Scotland, will aid you in understanding the stages of fermentation for a lively sourdough starter: when to refresh it and when to use, so that you can consistently bake light, flavoursome and nutritious sourdough loaves.



1

24

The graphic depicts a 24 hr cycle, where the sourdough starter has been refreshed (fed) at 0 hrs and is left to ferment at an ambient room temperature of between 20–24 deg C. The starter has been refreshed at approximately equal proportions flour, water and sourdough starter.

A Sourdough Starter

is a mixture of flour and water in which beneficial bacteria and wild yeast co-exist in a symbiotic relationship.

When we refresh our starter by adding more flour and water to it, not only does this give more food for the bacteria and wild yeast (already present through the flour), it also adds more beneficial bacteria which are naturally present on the flour, adding to a diversity in bacteria. In certain proportions and temperatures, this action leads to an abundance of lactobacillus, bacteria and wild yeast.

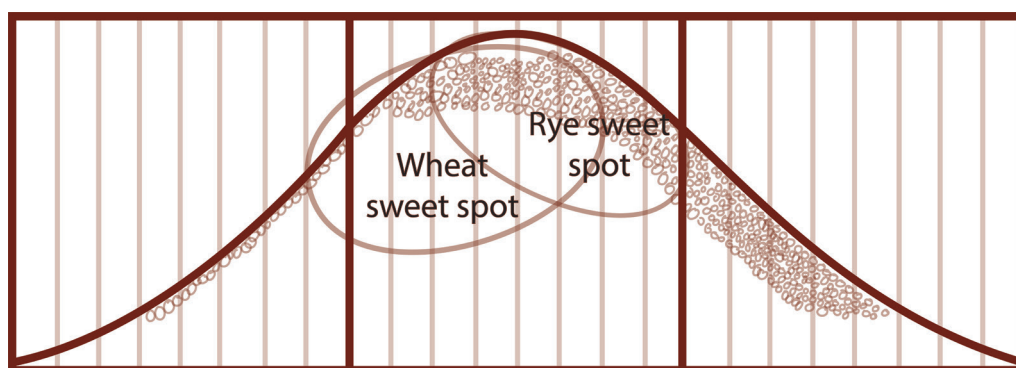
We will now discuss creating and controlling the environment to ensure that there is an abundance of those bacteria and yeast in the fermented flour we will use to make our bread.

Levain

is the term used here for a sourdough starter which will be used for making and fermenting the dough for your bread. It is made up of the original sourdough starter and a portion of the flour and water from the final dough. This levain can be fermented from 5 hrs up to approximately 16 hrs - depending on the type of flour used and the temperature it is fermenting at.

Sweet spots

The graphic indicates two “sweet spots” one for strong white wheat flour and one for wholemeal rye flour.



When making the levain it is worth aiming for these “sweet spots” to bring consistency to your baking.

In these “sweet spots”, the levain should be well fermented with an abundance of wild yeast. Extra consideration is required for wheat levains to ensure the gluten structure of the flour does not excessively degrade during this fermentation process.

Rye levain

Wholemeal rye flour ferments really well, it will also add a complexity of flavour and a diversity of nutrients to any loaf.

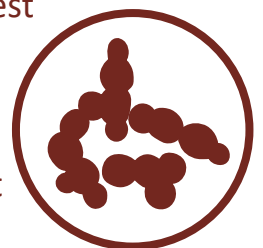
If using a wholemeal rye levain for your breads, a relatively easy way to achieve a lively levain with an abundance of beneficial lactobacillus bacteria, wild yeast and enzymatic activity, is to refresh the starter with equal parts starter, wholemeal rye flour and lukewarm water 8–16 hrs before you wish to mix your dough (see notes below). Leave the levain to ferment at an ambient temperature of between 18-26 deg C. This is indicated by the “Rye sweet spot” area on the graphic.

Before using a levain for baking, it should be nicely aerated; indicating an abundance of wild yeast, smell sweet and almost beery, with a sweet and sour crab-apple like flavour. If you can still taste an abundance of flour, it may be worth letting it ferment a little longer. Rye levain can still be used when it has a robust acidic flavour, this fully fermented state is favoured for 100% rye sourdough breads.

Wheat levain

Sometimes you may wish to use a levain made with strong white flour. When we ferment strong white flour, we also have to bring into consideration the fact that the beneficial lactobacillus bacteria in the starter are feeding on the proteins in the flour. This is a good thing as it breaks down the gluten in the flour, making it easier for us to digest the bread. Gluten is made from a combination of the gliadin and glutenin proteins naturally found in wheat. These proteins, when wet, bond together to form a stretchy matrix. This matrix traps the carbon dioxide produced by the wild yeasts and gives us lovely light loaves.

When we use strong white flour in the levain, it is important to mix the levain with the rest of the flour and water to form the dough before this gluten structure of the flour in the levain has totally degraded. For this reason, the “Wheat sweet spot” is achieved usually between “Young” and “Ripe” on The Sourdough Starter Cycle, from about 5 hrs up to a maximum of 14 hrs (after refreshing the levain with approximately even parts active wheat starter, strong white flour and tepid water).



Float Test for Wheat Levain



If using a wheat levain made from strong white flour, refreshed using approximately equal parts wheat sourdough starter, strong white flour and tepid water, another indicator of the levain's condition is known as "The Float Test". (We do not use this test for rye as a rye levain does not have the same gluten structure.)

Before carrying out the float test, it is good practice to taste the starter. If you can taste a lot of flour, the starter may need to be fermented longer, if it tastes vinegary it may have peaked and be beginning to degrade. This simple taste test will guide us as to where the levain is on The Sourdough Starter Cycle. Again a nice beery smell, a mild yoghurt or mild sweet and sour flavour is favoured. With a wheat levain the sweet spot errs towards a floury taste.

Next we can check if there is an abundance of wild yeast in the levain. Wild yeast are naturally occurring in the levain and produce carbon dioxide gas when they feed on the starches and sugars in the flour. We can judge the abundance of these yeast by seeing if there is enough gas in the levain mix to keep a spoonful of it afloat on water.

To carry out "The Float Test", take a glass or beaker of cold water and using a wetted spoon, take a spoonful of the wheat levain and gently slide the levain onto the water. If it floats, we know that there is an abundance of wild yeast and our levain is good to use. If it sinks, it is indicating that the levain needs to ferment longer or has over-fermented. This is where the taste of the levain comes in. If the levain tastes floury and sinks, it should be left to ferment for longer. If it tastes very vinegary, breaks up and sinks it may have over-fermented.

Where a healthy levain tastes vinegary and sinks, it is usually because it has over-fermented and the gluten structure has broken down during fermentation. If you do want to use the levain when it has over-fermented, firstly, you can reduce the amount of water in the recipe slightly. Try and not let the temperature of the dough go above 27 deg C, preferably keeping it between 21 and 23 deg C, between mixing and baking. Also you are better off baking the dough when it is slightly under-proved and has plenty of oven spring.

How to affect the sourdough starter cycle

We can affect the time of when these “sweet spots” occur and the length of our curve by changing three main elements:

- Temperature
- Inoculation
- Hydration

Temperature

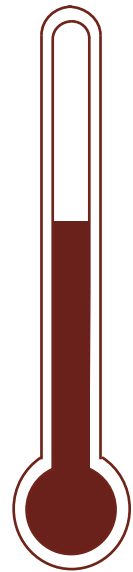
During lacto-fermentation (that’s what’s going on when you’re making sourdough), temperature plays a vital role. If you want to slow down or quicken the fermentation process, shorten or lengthen out the curve, you can do this by fermenting at different temperatures.

If you wish to refresh the wheat starter, say 10–14 hrs before you wish to use it, you are best to leave it in a cool area to ferment, about 16-18 deg C is perfect. The next day the leaven will appear as if it has been fermenting for only approximately 8 hrs, right in the “Sweet Spot”.

In winter if your house is cold i.e. below 20 deg C, it may take longer for the levain to ferment than in summer, in which case you can either leave the levain to ferment in a warm area of your house or mix the starter and flour with warm water at 30-35 deg C, so that you hit the “sweet spot” at the desired time.

In summer, you may wish to refresh the starter with cold water so that the levain does not over-ferment and go past the “sweet spot” by the time you get to use it.

In a warm environment 22-28 deg C, if you wish to have a lively levain in a short amount of time, refresh the starter, at a ratio of 1:1:1 with warm water, 30-35 deg C so that it ferments quickly and you sit nicely in that sweet spot in 5-8 hrs.



Inoculation ratios

The inoculation is the amount of the original starter we use to make the levain.

Equal parts starter, flour and water are often represented as 1:1:1.

Twice as much flour and water to starter represented as 1:2:2.

It is not necessary to refresh the levain with equal parts starter, flour and water but it is done for ease of use, especially when we are first learning how to make sourdough levains. (They do run the risk of over-fermenting though and reaching the “sweet spot” too soon.)

Wheat starters can easily be refreshed: one part active starter to two parts strong white flour and two parts water 1:2:2. Whilst rye starters can be refreshed one part active starter to five parts wholemeal rye flour and five parts water 1:5:5.

The ratio of water to flour can also affect the length of time the levain takes to ferment, with stiff levains taking longer to ferment than liquid ones. We will discuss hydration next.

Hydration

Like all organisms, microorganisms - in our case beneficial bacteria and wild yeast - rely on available water for growth. We can therefore vary the amount of water (hydration) in our starter to control the fermentation.

A starter with a lower ratio of water to flour in it will take longer to ferment than one with a higher ratio of water to flour.

This aspect of fermentation is very useful when we are fermenting wheat levains in a warm environment. To preserve the gluten structure of the flour in the levain, the ratio of water to flour can be reduced and thus slow down the fermentation process.

Where we are using wholemeal wheat or spelt, especially any heritage or ancient grains for our levain, it is usual to make a “stiff starter” i.e. reduce the amount of water down to a maximum ratio of 1 part water to 2 parts flour. The dough should still feel soft and pliable so that adequate fermentation can occur.

Happy Baking!

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We wish you well with your baking!

Julie & Joe

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