FERMENTATION

Central to the bread-making process, fermentation arises from the development of natural "wild" yeasts in the dough (the sourdough starter) or from the addition of commercially developed baker's yeast—or from a combination of the two. Bakers everywhere manage this process on a daily basis but, in fact, it is a complex physical-chemical operation. A good understanding of how the mechanisms of fermentation work will help you bake bread that will delight your family and friends.

WHAT MAKES BREAD RISE?

At the end of the kneading process, the dough is left to rise on the work surface or in a bowl, covered with a damp cloth. This first stage of fermentation is called "rising," or in French, *le pointage* (see also page 30).

At this stage the micro-organisms contained in the flour and the wild yeasts (as distinct from baker's yeast) begin to multiply, using other ingredients present (essentially sugars such as glucose and maltose), as food. By breaking down these sugars in an oxygen-deprived (anaerobic) environment, the micro-organisms convert carbon dioxide and alcohol (ethanol). The carbon dioxide gas is what makes the dough inflate and therefore "rise." The dough's ability to retain this gas is due to the formation of wheat proteins (gluten) in a continuous elastic network during the kneading process.

FERMENTATION WITH A SOURDOUGH STARTER

Making bread with a natural starter involves maintaining a balance between the actions of bacteria and yeasts. The difficulty lies in the fact that the bacteria (called "lactic," because they produce lactic acid) act at a temperature of around 86°F (30°C) while the yeasts act best at temperatures between 71.5-78.8°F (22-26°C). Low temperatures will cause the sourdough bread to taste overly sour. Kneading, hydration, temperature, time, and ingredients all affect the fermentation process.

LIQUID STARTER AND FIRM STARTER

The terms liquid starter and firm starter are used, depending on the proportions of water and flour. A liquid starter is prepared by mixing 50 g (scant ¼ cup) water with 50 g (scant ½ cup) flour, while 30 g (2 tablespoons) water is sufficient for a firm starter.

△ All the recipes in this book are made with a liquid sourdough starter because it is simple to use: it mixes into the flour as easily as water. Bear in mind that liquid leaven will represent between 20-50% of the weight of the flour.

CARING FOR THE STARTER

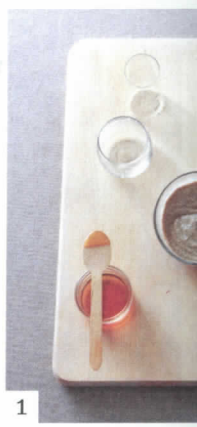
The starter will remain alive for an average of 3 days after it has been refreshed. Accordingly, it should be refreshed at 3-day intervals by adding 50% of its own weight in water and flour. For instance, if you have 300 g of starter remaining, add 75 g (scant ⅔ cup) flour and 75 g (⅓ cup) water. Remember that the starter is a living thing and that you need to nourish it to keep it alive. If you will not be baking bread for several days, or if the ambient temperature rises, seal the jar tightly and store it in the refrigerator, where it will keep for several weeks. You can adapt the initial quantity of starter, depending on how often you plan to bake.

LIQU
SOURDO
STAR

To make about
(4 cups) liquid s
starter

INGREDIENTS

- 140 g (scant 1
organic light,
or dark rye flo
- 240 g (1 cup) w
86°F (30°C) te
- 10 g clear hone
- 100 g (generou
all-purpose (p



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LIQUID SOURDOUGH STARTER

To make about 500 g (4 cups) liquid sourdough starter

INGREDIENTS

- 140 g (scant 1½ cup) organic light, medium, or dark rye flour
- 240 g (1 cup) water at 86°F (30°C) temperature
- 10 g clear honey (or malt)
- 100 g (generous ¾ cup) all-purpose (plain) flour

DAY 1

Use a spatula to mix 20 g (¼ cup) rye flour with 20 g (4 teaspoons) water in a bowl, then add 5 g (¾ teaspoon) clear honey [1, 2]. Cover with a clean cloth and leave for 24 hours in a warm place. If the starter curdles, begin again.

DAY 2

Bubbles will have formed on the surface. In a larger container mix together 40 g (scant ½ cup) rye flour, 40 g (2⅔ tablespoons) water, and 5 g (¾ teaspoon) clear honey. Stir in the mix from the first day. This is called "feeding" or "refreshing" the starter. Cover with a cloth and leave to ferment for 24 hours.

DAY 3

The mixture will be bubbling noticeably. Mix 80 g (¾ cup) rye flour and 80 g (generous ⅔ cup) water in a larger bowl. Blend in the mix from the second day. Cover with a cloth and leave to ferment for 24 hours [3].

DAY 4

To the third day's mix, add the all-purpose (plain) flour and 100 g (scant ½ cup) water. Stir well. Your starter is now ready to use. It will have the consistency of thick pancake batter. Store it in a glass jar, lightly covered, but so that air can get to the starter. (If you plan to keep it for some time, it should be stored airtight in the refrigerator.)

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