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## Natural bread making with sourdough

The use of sourdough in bread making offers multiple advantages, including greater adaptability with respect to artisanal processes, a greater availability of nutritional elements in bread and a variety of tastes due to the diversity of starters as well as to a wide range of growing soils, grains and bread-making techniques.

### Definition:

Sourdough obtained from natural fermentation is defined as “a dough fermented by acidic reaction, made with flours and/or grains, usually finely ground, and water, to which fruit preparations (a little juice, for example) may be added. It is made without the active addition of yeast or other microorganisms, and continued with successive systematic additions of only grains and water.

These successive ‘refreshments’ determine the selection of microbial flora of the natural yeasts, which are made up of lactobacilli and yeasts that develop together, whose activity is sufficient to assure the fermentation necessary for kneading the leavened bread” [1].

In brief, sourdough is a fermented mix of water and flour in which yeast and bacteria develop. The microbial biodiversity of the yeasts is guaranteed by the variety of bread-making facilities, the different techniques of bread makers and bread-making farmers as well as by the variety of grains used [2]. During the various phases of making bread with sourdough, the acidic mother dough (the “basic” yeast for the preparation of mature starter) is refreshed by the addition of flour to the end of obtaining the mature mother dough to then be used for fermenting the bread dough. This will be kneaded after a brief rise time (the main leavening) and baked after a second one (second leavening).

Figure 1 shows an image of mature mother dough.

### Transformation: versatility of behavior during the course of artisanal processes

The diversity of sourdoughs finds expression in a microbiological system able to modify reactions to changes in bread-making conditions, conserving the efficacy of fermentation processes in non-standardized artisanal conditions, which are therefore subject to changes (in temperature, humidity, etc.) [2]. On the other hand, the use of sourdough is particularly suited to breads that require limited kneading and long fermentation times, such as those baked by bread-making farmers (see the Innovation Factsheet on the study of the quality of hand-made breads).

In addition, using their own sourdough gives bread makers more independence, as they do not need to use commercial yeast. Bread making with sourdough creates a new relationship between bread makers and their breads and the organisms that shape them; bread makers are able to experiment with the diversity and different degrees of activity of the sourdough, in particular by varying the types of flour used, temperature, hydration and the length of refreshments.

## Nutritional qualities: greater availability of nutrients

The biological availability of minerals present in bread increases when it is made with sourdough. Furthermore, digestion of starches is slower, producing a lower glycemic reaction. In general, leavening with sourdough produces bread with fibers that are more easily digestible, as phytic acid and the production of prebiotics are reduced, thanks to the lactobacilli in sourdough, which liberate extracellular polysaccharides <sup>[3]</sup>.

## Sensory qualities: diversity of tastes and typical characteristics

Bread made from sourdough offers a great variety of products, thanks to the different characteristics of the yeasts (which is not the case with standardized commercial ones), of techniques (both in growing the grains and making the bread), of the populations of wheat used and of the lands that grow them (climates and soils) <sup>[4]</sup>. The yeasts and bacteria present in bread leavened from mother dough give it particular aromas, which vary according to the microbial composition of the sourdough <sup>[2]</sup>. Furthermore, bread made from sourdough can be conserved well, for longer periods than bread made with other types of yeast.

## Prospects:

The importance of sourdough in artisanal bread making—in particular the nutritional and sensory qualities of bread made by this method—is such that the diversity of techniques that go into its production must be continued and preserved. Even so, there is still no consistent program for managing microbial biodiversity that is able to bring together the protagonists of the bread production chain, in spite of the motivations and requests of bread makers and bread-producing farmers <sup>[2]</sup>. Conservation of the techniques of artisanal bread making with sourdough is also important because it permits dynamic on-site management of microbial biodiversity and the maintenance of the processes of evolution and adaptation of these microorganisms in their environments <sup>[2]</sup>.



Figure 1

## Bibliography

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