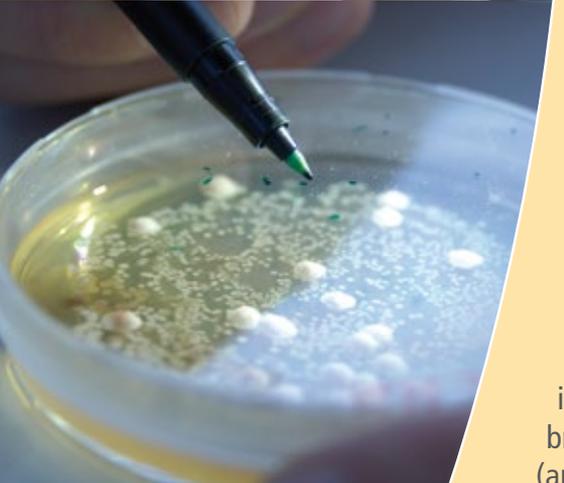


# SOURDOUGH FERMENTATION



## Food fermentations

Food fermentations are realised with the aid of selected microorganisms. They produce fermented food, e.g. cheese and yoghurt from milk, or alcoholic beverages like beer and wine, or raw sausages (salami). Sourdough, as an example of cereal fermentation, is one of the oldest kinds of fermentation used by mankind. It has been applied for at least 4000 years, as was shown by excavations in Egypt, Switzerland and Mesopotamia.

## Which microorganisms do the job?

Sourdough is fermented by lactic acid bacteria and yeasts with a dominance of lactic acid bacteria. The main aim of sourdough is the production of flavour. Preferments are dominated by yeasts which are aimed at leavening activity. The microorganisms in sourdough and preferments produce important flavour compounds.

## BÖCKER Reinzucht-Sauerteig

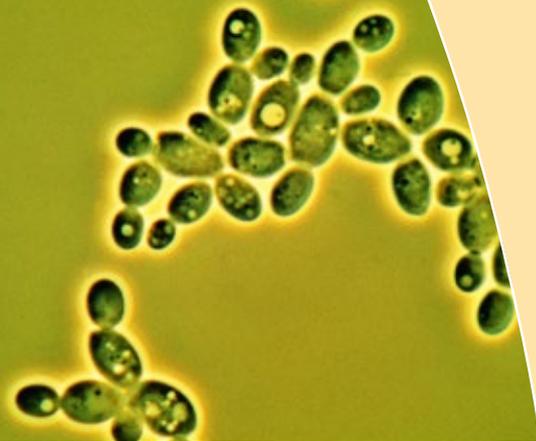
Around 1900, Ernst Böcker, distillery master and founder of Ernst Böcker GmbH & Co. KG, transferred his microbiological knowledge of yeast production to the production of sourdough starter cultures: "BÖCKER Reinzucht-Sauerteig" was born, the first commercially available starter culture for in-house fermentation of rye sourdough. BÖCKER Reinzucht-Sauerteig is still in use today, nearly unchanged. The first patent for an apparatus for sourdough production, issued in 1908, also belongs to Ernst Böcker GmbH & Co. KG.

Ernst Böcker's work aimed at making life easier for sourdough bakers by producing starter cultures for a constant bread quality and improved unique flavour. "Reinzucht" means that only the best adapted microorganisms are dominant in the dough.

BÖCKER Reinzucht-Sauerteig is dominated by the lactic acid bacteria species *Lactobacillus sanfranciscensis*. It is a highly competitive culture in traditionally propagated sourdoughs for typical taste and flavour in bread. It also improves dough and texture properties (anti-staling). Until now, *Lactobacillus sanfranciscensis* has only been isolated from sourdoughs which are propagated by the principle of natural "Reinzucht". Ernst Böcker GmbH & Co. KG is the only supplier of starter cultures (fresh or chilled) with *Lactobacillus sanfranciscensis* on today's market.



**BÖCKER**  
The experts in sourdough



### Effects of lactic acid bacteria and yeasts

Lactic acid bacteria and yeasts are the most important microorganisms in sourdough. Lactic acid bacteria are divided into two groups through their carbohydrate metabolism: homofermentative lactic acid bacteria, which produce only lactic acid from sugars, and heterofermentative lactic acid bacteria, which produce lactic acid, carbon dioxide and ethanol or acetic acid, respectively. Sourdough yeasts produce ethanol and carbon dioxide from sugars. During the fermentation process, aroma precursors are produced by lactic acid bacteria and yeasts, which are transformed into the typical bread flavours during the baking. The production of Levan (Oligofructose) with *Lactobacillus sanfranciscensis* leads to an improved fresh-keeping of sourdough breads. Growth of spoilage moulds or rope-forming bacilli is prevented by lactic and acetic acid of the sourdough. The quality of sourdough is mainly affected by the used species of lactic acid bacteria, temperature and fermentation time.

### Sourdough research

Both basic and applied research are important parts of BÖCKER's company philosophy. Long-time relationships with universities and other scientific research organisations allow the continuous improvement of the employees' knowledge. An impressive strain collection of microorganisms supports product development and innovations. Most of the newly described sourdough lactobacilli species were first isolated from BÖCKER sourdoughs, e.g. *Lactobacillus Mindensis*.

### Natural and safe microbiological processes

Ernst Böcker GmbH & Co. KG makes the products of natural, but controlled microbial fermentations available for the market. Ernst Böcker GmbH & Co. KG combines the knowledge of traditional fermentation schemes with the results of current research in order to produce sourdough starters, preferments and sourdough products. With this emphasis, Ernst Böcker GmbH & Co. KG is the reliable partner for bakeries and ingredient suppliers all around the world. ■

