Sourdough applications for bread production: Industrial perspectives

The requirements of industrial bread production and sourdough fermentations have necessitated the development of sourdough fermentations and sourdough products that differ from traditional processes in several important aspects:

- automation of the sourdough and development of continuous fermentation processes. This approach was pioneered in the Soviet Union during the industrialization of bread production in the 1930s. Initially, industrial sourdough production merely aimed at a scale-up and automation of traditional fermentation processes. Currently, automated and/or continuous fermentation equipment for sourdough production is available on the market that satisfies the requirements of a large variety of applications and production scales;

- separation in time and place of the sourdough production from bread production. The sourdough fermentation is frequently carried out by specialized suppliers to the baking industry and the sourdough (product) is added to the bread dough as a “natural”, fermented bread improver to replace chemical acidulants or other additives. A requirement for the use of stabilized sourdoughs as bread improver is the production of standardized and shelf-stable products for convenient use in baking;

- development of defined starter cultures as inoculant for sourdough fermentation, and the selection of starter cultures based on specific metabolic properties relevant for bread quality. The microbiota of traditional sourdoughs generally consists of several strains of lactic acid bacteria and yeasts and the control of the microbiota composition is based entirely on the experience and the skill of the baker. Currently, defined single-strain and multi-strain culture preparations are available as inoculants for sourdough fermentation. The strain selection for industrial applications is increasingly characterized by a targeted selection application development of starter strains with specific metabolic traits for improved bread quality.

To present current development in the industrial application of sourdough, in this section are combined three industrial contributions to the Third International Symposium on Sourdough. Criteria for the industrial application of liquid sourdough fermentations are presented by Carnevali et al. The application development for specific starter cultures with metabolic properties is presented by Wick et al., using the example of dextran-producing strains of *Leuconostoc mesenteroides*. An overview on the production of sourdough and stabilized sourdough products for convenient use in baking, and technological aspects of their use in baking applications is provided by Brandt.

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