In The Production of Wheat Breads Using Sourdough

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The most ancient method of biological loosening of the dough is the use of wheat, hop, wine, pea - star anise, pea - aniseed, etc. starter cultures, the microflora of which developed spontaneously. But even today, wheat leavens are a means of increasing acidity, intensifying the dough preparation process, improving taste and aroma, preventing potato disease of bread and its mold Sattsaeva I.K. (3, p. 67-94) developed a technology for making wheat bread, resistant to microbial contamination, based on hop sourdough. The conditions for the cultivation of the starter culture have been optimized, the possibility of stabilizing the microbiological composition of the latter by using a hop broth with a content of 90.8% isogumulone and wheat bran has been established.

The use of concentrated lactic acid starter culture (KMKZ) is recommended for enterprises with intermittent operation, since during off-hours this starter culture does not require forced cooling or other canning methods. The preparation of KMKZ is carried out according to the Leningrad scheme using liquid cultures of lactic acid bacteria L. plantarum - 30, L. casei - 26, L. brevis - 1, L. fermenti - 34, or dry lactobacterin.

The acidophilic starter culture consists of the bacteria I. asidophillus-146 and the Ryazan-17 yeast strain adapted to high temperatures (40 ... 450C) on the basis of the Ryazan race. A high level of amino acids was found in the starter culture: the content of lysine is 1585 mg / 100 g, leucine - 1275 mg / 100 g, valine - 510 mg / 100 g. The use of this starter culture is effective for improving the quality of products with strong gluten, with accelerated dough preparation technologies. A variant of the yeast starter culture is a starter culture created on the basis of a highly active yeast strain "Krasnodarskaya - 11", which was isolated from a spontaneous starter culture. A distinctive feature of the yeast starter culture is the ability to use a water-flour medium for growing yeast. In production conditions, yeast starter culture can be used instead of liquid yeast at bakeries. Vitamin starter culture was created as a result of research into the possibility of using carotene-synthesizing yeast in the composition of wheat starter culture, which are representatives of the epiphyte (extrasoil) microflora and develop on the ground parts of various plants in areas with increased ultraviolet radiation. The use of starter cultures with carotene-synthesizing yeast ensures the content of □-carotene in bread samples in the amount of 0.03 ... 0.58 mg / 100 g. A vitamin starter culture is used to improve the quality of flour products with low gluten. The basis of the complex starter culture is made up of museum strains of three types of lactic acid bacteria L. casei - C1, L. brevis - B78, L. fermenti - 34, propionic acid bacteria Propionibacterium freundenreichii ssp. Shermanii BKM-103 and S. cerevisiae yeast. The complex starter culture has antibiotic activity against spore-bearing bacteria and molds, it is recommended to use it to improve the quality of flour products with low gluten, with an accelerated method of dough making, as well as in the technology of products with wheat bran. Propionic acid sourdough is the most effective biotechnological means of preventing bread potato disease and mold. Propionic and formic acids synthesized by the Propionibacterium freundenreichii ssp. Shermanii BKM-103, have a maximum inhibitory effect on the development of spore bacteria, inhibiting the flavin enzymes of the respiratory cycle. In addition, this culture in the process of metabolism accumulates significant amounts of vitamin B12.

The ergosterol starter culture was developed based on the use of a hybrid yeast strain 576, obtained from the Institute of Gene Biology, Russian Academy of Sciences. Ergosterol starter culture is effective for increasing the nutritional value of bakery products, it is recommended for use in ecologically unfavorable regions. On the international market, Ernst Böcker GmbH & Co. KG ”(Germany) offers a wide range of both starter starter cultures and inactivated starter cultures (pasty, liquid and dry) ready to use. The assortment of the company includes various inactivated starter cultures: "Böcker Germe" - dry starter culture for the production of wheat and wheat-rye bread; Böcker Direkt25 - liquid sourdough for wheat bread; Böcker Sprossenpaste Weizen - a pasty starter culture containing germinated wheat grains; "Böcker Wellness-

Krauter" - a pasty starter culture, which contains a unique composition of herbs (wild garlic, basil, dandelion, nettle, violet, watercress, cornflower); "Böcker Kartoffelpaste" is a pasty potato sourdough with potato cubes.

The expediency of using various composite mixtures based on bioconverted barley in the preparation of starter cultures has been established. With this method of processing grain raw materials, the entire pathogenic microflora is destroyed, while the value of the product increases by 1.4 ... 1.8 times, in contrast to the analogue. Lebedenko T.E. et al carried out a comparative assessment of the methods of making dough from wheat flour to ensure high quality of finished products, duration, labor intensity of the process, etc., highlighted the advantages and disadvantages of each of them, as well as rational conditions of use.

The range of use of starter cultures is very wide, but their biotechnological potential has not yet been sufficiently studied. It should be noted that the technology of breeding sourdough cultures is complex, in the dispensing cycle, “pure” cultures of acid-forming bacteria and yeast are needed, which is not always possible in the conditions of bakery enterprises in remote regions, as well as for small producers of bakery products. In addition, in the hot climate of Uzbekistan, it is very difficult to maintain consistently the required technological parameters, and, consequently, the quality indicators of starter cultures.

New perspectives for the industry open up the possibility of using spontaneously fermented poly-strain starter cultures (hereinafter PZSB), characterized by the availability and no need to purchase "pure" cultures for the distribution cycle. However, they are practically not used in the production of mass varieties of bread due to the production of products of a reduced volume with insufficiently loosened crumb.

As a result, it is necessary to develop technological solutions to stabilize the microbiological composition of this type of starter culture in order to obtain high-quality products.

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