

IMPROVING THE QUALITY OF BREAD BY USING DEHYDRATED SOURDOUGH

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INTRODUCTION

There is a strong tendency in Northern and Western Europe for obtaining industrial bread with the quality as close as possible to the traditional - artisanal one, which is very appreciated by consumers. Sourdough is a mixture of flour and water that is fermented either spontaneously or by the addition of lactic acid bacteria. The lactic acid bacteria and yeast fermentation generates a complex mixture of organic compounds that have a strong impact on the rheology of the dough and the final quality of the bakery products. The use of dehydrated sourdough in industrial bread making processes represents a useful and easy to use technology for integration the properties of a traditional bread into an industrial one. There are two types of dehydrated sourdough :

- inactive - obtained after a complete fermentation process, dried, with all the active elements - lactobacilli, yeasts - totally deactivated but suitable for direct manufacturing processes, involving short fermentation times,
- active - obtained in the same way as inactive dehydrated sourdough but with addition of lactic bacteria that are activated during the manufacturing process producing extra flavour, taste and acidity. These are recommended for delayed fermentation processes.

MATERIALS AND METHODS

Inactive dry sourdough is the sourdough obtained after a completely dry fermentation process and all the active elements lactobacilli, yeasts are completely deactivated. They are suitable for direct manufacturing processes with short fermentation times. In the case of lactic fermentation, the mixed fermentation produced by lactic bacteria and yeasts generates a complex mixture of organic compounds that have a strong impact on the rheology of the dough and the final quality of the bakery products. The analysis were performed in the Food Chemistry Laboratory and Sensory Analysis Laboratory.

Table 1. Sensory analysis results

Characteristics	Sample 534	Sample 620	Sample 239	Sample 345
Exterior appearance - color	2,67	2,50	3,50	3,50
Interior appearance - color	1,83	1,44	3,56	3,39
Interior appearance - pore uniformity	2,11	2,78	4,06	3,17
Interior appearance - elasticity	3,78	3,28	1,89	2,83
Aroma - pleasant baked product	1,94	3,11	2,44	3,00
Taste - chemical	0,33	0,11	0,22	0,22
Taste - sweet	0,56	0,94	0,56	1,33
Taste - salty	1,11	0,72	1,00	1,17
Taste - sour	0,78	0,44	0,67	1,17
Taste - bitter	0,56	0,28	0,83	1,00
Taste - auxiliary: metallic, astringent	0,44	0,11	0,56	0,33
Smell - Pleasant baked product	2,22	2,89	2,17	3,00
Total acceptability	1,67	0,56	1,11	0,56

RESULTS AND DISCUSSIONS

The use of sourdough has a long tradition and still plays an important role in the bread-making process. Sourdough is obtained by spontaneous fermentation of a mixture of flour, water and salt; recent years have seen the use of specific cultures and control of the fermentation process. Sourdough is used in baking and its ability to improve the quality and extend the shelf life of bread has been widely studied ¹⁻⁴.

4 bread samples coded as follows: 534 (Bread with white flour, without sourdough), 239 (Bread with whole meal flour, without sourdough), 620 (Bread with white flour, with sourdough) and 345 (Bread with whole meal flour, with sourdough), were analyzed using an evaluation panel consisting of 9 people with an average age of 30 years. The results obtained are presented in Table 1 and Table 2.

Table 2. Physico-chemical analysis results

Test	Sample 534	Sample 620	Sample 239	Sample 345
Moisture (%)	43.88	45.48	43.84	38.50
Moisture in breadcrumbs (%)	0.36	0.52	3.76	5.92
Mass (g)	385.98	398.7	386.67	364.68
Acidity (°)	0.9	2.1	1	2.0
Total ash (%)	1.89	2.64	1.92	2.68
Protein	14.03	17.58	13.51	16.28
Fat (%)	0.1	0.4	0	0.3
Starch (%)	75	67	70	59
Total dietary fiber (%)	0.33	2.84	0.29	2.46
Salt (%)	0.99	0.88	0.95	0.82
Volume (cm ³ / 100 g)	342	224.5	382.8	253.7
Porosity (%)	82	64	77	69
Elasticity (%)	98	72	97	87

CONCLUSIONS

The use of sourdough in bread-making influences all aspects of bread quality (flavor, texture, shelf life, nutritional quality). Bread aroma is determined by numerous factors, including the sort of cereal flours, the characteristics of sourdough preparation, the baking conditions, and the metabolism of fermenting microorganisms.

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