Sensory analysis of experimental hearth baked dark bread added with soy flour

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Abstract

The purpose of this study is the addition of soy flour in different proportions (5%, 10%, 15%) to wheat flour and producing dark bread baked on hearth by the classical method. The four types of obtained bread (dark bread, dark bread added with 5% soy flour, respectively 10% and 15%) were analyzed by a number of ten sensory panelists. The sensory evaluation categorized the samples of bread as "good" and "very good".

Depending on the total points through the point scaling method, there is an increase or decrease in the score of the qualities or defects. The analyses conclude a decreasing in scores with the increase of the content of added soy flour.

Keywords: bread, soy flour

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1. Introduction

The current efforts in the food domain are directed to increase the nutritional value of food by producing healthy food without additives, preservatives, heavy metals or other compounds with negative impacts on consumers health.

Secondly, new food products are easely tasted through sensory analysis, as one of the most powerful tools to understand how the aspect and taste of food guides consumers' preferences. The sensory analyes are simply, they are simple and don't require equipments or expensive reagents,.

The research topic of this study is for great interest in the EU, namely the impact of using soy flour to produce bread and its effect on improving the quality and nutritional properties of the bread through these additions. [4]

2. Materials and Methods

We produced experimental hearth bread from commercial dark flour added with two types of soy flour, from two different industrial producers, A and B, in different proportions (5%, 10%, 15%). [9, 10, 11]

The main raw materials that enter the manufacturing recipe of bread are: dark wheat flour 100%, soy flour (5%, 10%, 15%), salt 2%, east 1.5%, breeder 0.5%, water 55%.

The production process of bread used the classical scheme with the following technological operations: preparation and dosage of raw materials (flours, water, east, salt), dough kneading, dough fermentation, dough processing, bread baking, storage of finished products. [1, 5, 6, 7]

The final products, dark wheat bread and dark bread added with soy flour, were produces at a private company from Timişoara and the sensory analysis were performed at the Laboratory for analysis from the Faculty of Food Processing, BUAS Timisoara.

The organoleptic examination were carried out according to the standard methods given in Table 1.

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The organoleptic examination were made on whole product and on half cuts and slices.

Each organoleptic characteristic is described and appreciated with 3 or 4 points, differentiated according to the importance of that characteristic in the overall organoleptic assessment of the product. 5 testers performed these analysis on whole bread and on sections. [2, 3, 8]

3. Results and Discussions

The sensory characteristics of experimental samples of dark bread added with soy flour are shown in Tables 2 and 3.

Following the examinations, the analyzed products received the ratings presented in Table 4.

Table 1. Organoleptic characteristics

Organolpetic characteristic	Admissibility conditions
Product form	The form is visually appreciated, the volume proportional to the mass and the presence of possible defects (deformed product, flattened or bulging, crushed, broken etc.).
Exterior aspect	Notice the appearance, thickness, color and possible cracks, wrinkles, soldering, thick, burned or blistered shell. The surface color is examined visually and appreciated if it is characteristic of the analyzed assortment.
Interior aspect	Visually examination of the product in the section (uniformity). Visually examination of the product color in section, if it is characteristic of the analyzed assortment. Visually examination if the product mass is uniform, broken off by the shell.
Smell	To assess the smell, cut the product, press it several times and smell immediately. It will be analyzed if the product has strange smell like sour, smudge, mold or others.
Taste	A part of the product is tasted and it will be appreciate if the taste is characteristic or if some defects appear like: strange taste, sour, bitter, too salty.

Table 2. Scoring scale for assessing the sensory characteristics of the blank sample and dark bread sample added with soy flour A

Product characteristics	Maxim scores	Awarded scores			
		Blank sample	Dark heart bread added with 5% soy flour	Dark heart bread added with 10% soy flour	Dark heart bread added with 15% soy flour
Exterior aspect	4	3.9	3.5	3	3
Shell aspect	3	2.9	2.9	2.3	2
Core aspect	3	3	3	2.7	2.6
Consistency and behavior in mastication	3	2.9	3	2.9	2.8
Smell	3	2.9	3	2.8	2.7
Taste	4	4	3.8	3.8	3.5
Total points	20	19.6	19.2	17.7	16.6

Table 3. Scoring scale for assessing the sensory characteristics of the blank sample and dark bread sample added with soy flour B

Product characteristics	Maxim scores	Awarded scores			
		Blank sample	Dark heart bread added with 5% soy flour	Dark heart bread added with 10% soy flour	Dark heart bread added with 15% soy flour
Exterior aspect	4	3.9	3.8	3	3
Shell aspect	3	2.9	2.9	2.6	2.4
Core aspect	3	3	2.9	2.7	2.2
Consistency and behavior in mastication	3	2.9	3	2.8	2.8
Smell	3	2.9	3	2.9	2.7
Taste	4	4	3.8	3.8	3.5
Total points	20	19.6	19.4	17.8	16.8

Table 4. Qualities attributed to blank sample and dark bread with different additions of soy flour

Sample	Maxim score	Qualities
Blank sample	19.6	Very good
Dark hearth bread added with 5% soy flour A	19.2	Very good
Dark hearth bread added with 10% soy flour A	17.7	Good
Dark hearth bread added with 15% soy flour A	16.6	Good
Dark hearth bread added with 5% soy flour B	19.4	Very good
Dark hearth bread added with 10% soy flour B	17.8	Good
Dark hearth bread added with 15% soy flour B	16.8	Good

4. Conclusions

Overall, the forms of dark bread added with different proportions of soy flour different (5%, 10%, 15%) from two different industrial producers (A and B) were well defined, slightly deformed shell surface with few cracks. Shell coloring was uniform, golden red, darker then the blank sample. The crumb was not breakable, courteous, porous, non-sticky. The taste and smell were pleasant, aromatic, specifically, more pronounced.

The blank sample without soy flour obtained full marks for taste (4 points) and crumb (3 points), but regarding other sensory characteristics, it scores slightly lower, but overall, it stays into the category of "very good" quality obtaining. Samples of dark hearth bread added with 10% soy flour A and B received scores of 17.7 points and 17.8 respectively points because of the layouts exterior appearance of the shell, the consistency and smell that were slightly downgraded by tasters.

The least popular were samples of dark hearth bread added with 15% soy flour A and B, who received scores of 16.6 points and 16.8 points because of lower volume, flattened crumb, breakable, lower consistency from chewing, intense coloration shell, dark brown, very pronounced taste and smell.

In conclusion, according to the scoring, the most appreciated were the samples of dark hearth bread added with 5% soy flour A and B with scores of 19.2 and 19.4 points respectively. It can be observed a decreasing in scores with the increase of added soy flour proportion.

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