

## Sensory analysis of experimental hearth baked white bread added with soy flour

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### Abstract

The aim of the research was to study the use of soy flour added in various proportions (5%, 10%, 15%) to wheat flour to obtain white bread baked on hearth by the classical method.

Four types of obtained bread (white bread, white bread added with 5% soy flour, respectively 10% and 15%) were analyzed by a number of ten sensory panelists.

After performing the sensory evaluation, the samples of bread could be categorized 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

Current trends in the food domain are directed to product quality, aiming to produce food with high nutritional value, without additives, preservatives, heavy metals or other compounds with negative impacts for people. The possibility to improve the product quality of hearth white and dark bread baked through nutritional intervention brings public awareness of foods with added biologically active compounds, which contribute to their superior capitalization, the smooth functioning of the body and health.

The sensory analysis developed quickly into one of the most powerful tools to understand how the aspect and taste of food guides consumers' preferences. Sensory characteristics influence more than 50% the quality assurance and has become a basic and mandatory analysis, especially since it

does not requires equipments, expensive reagents, and is simple to perform.

The research topic is for great interest at the European level, namely the impact of the use of soy flour to produce white and dark bread and the 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 white 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: white wheat flour 100%, soy flour (5%, 10%, 15%), salt 2%, yeast 1.5%, breeder 0.5%, water 55%.

The production process of bread followed the classical scheme. The technological operations applied to obtain hearth baked bread are: preparation of raw materials (flours, water, yeast, salt), dosage of raw materials, dough kneading, dough fermentation, dough processing, bread baking, storage of finished product. [1,5,6,7]

The products (white wheat bread and white bread added with soy flour) were obtained at a bread producing company in Timișoara and the sensory analysis were performed at the Laboratory for analysis from the Faculty of Food Processing, BUAS Timisoara.

The organoleptic examination shall be carried out in accordance with Table 1, on the whole product and cut (halves or slices).

Each 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. Gaining the maximum score must be a maximum of 20 points. In order to perform this analysis, 5 persons were selected to examine each sample (whole bread and sections). [2,3,8]

### 3. Results and discussions

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

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

**Table 1.** Organoleptic characteristics of the finished product

Organoleptic characteristic of the finished product	Admissibility conditions
Form of the products	The form is visually appreciated, the volume proportional to the mass and the presence of possible defects (deformed produce, flattened or bulging, crushed, broken etc.)
Exterior aspect	Notice the appearance, thickness, color and possible cracks, wrinkles, soldering, thick, burnt or blistered shell. The surface color is visually examined and appreciated if it is characteristic of the assortment analyzed.
Interior aspect	Visually examination of the product in the section (uniformity). Visually examination of the color of the product in section, if it is characteristic of the assortment to be analyzed. 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 is appreciated if the taste is characteristic or if some defects appear like: strange, sour, bitter, or too salty taste.

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

Product characteristics	Maxim scores	Awarded scores			
		Blank sample	White heart bread added with 5% soy flour	White heart bread added with 10% soy flour	White heart bread added with 15% soy flour
Exterior aspect	4	3.8	3.3	3	3
Shell aspect	3	2.9	2.9	2.2	2
Core aspect	3	3	3	2.7	2.2
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
<b>Total points</b>	<b>20</b>	<b>19.5</b>	<b>19</b>	<b>17.4</b>	<b>16.2</b>

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

Product characteristics	Maxim scores	Awarded scores			
		Blank sample	White heart bread added with 5% soy flour	White heart bread added with 10% soy flour	White heart bread added with 15% soy flour
Exterior aspect	4	3.8	3.6	3	3
Shell aspect	3	2.9	2.8	2.5	2.2
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
<b>Total points</b>	<b>20</b>	<b>19.5</b>	<b>19.1</b>	<b>17.7</b>	<b>16.4</b>

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

Sample	Maxim score	Qualities
Blank sample	<b>19.5</b>	<b>Very good</b>
White hearth bread added with 5% soy flour A	<b>19.0</b>	<b>Very good</b>
White hearth bread added with 10% soy flour A	17.4	Good
White hearth bread added with 15% soy flour A	16.2	Good
White hearth bread added with 5% soy flour B	<b>19.1</b>	<b>Very good</b>
White hearth bread added with 10% soy flour B	17.7	Good
White hearth bread added with 15% soy flour B	16.4	Good

#### 4. Conclusion

Overall, the forms of white bread added with soy flour in different amounts (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 yellow for blank samples. For samples with added soy flour shell coloring was uniform, golden red, darker than 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 the added of soy flour has 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 quality "very good" obtaining a higher score (19.5 points) unlike white hearth bread added

with 5% soy flour A and B (19 and 19.1 points respectively). Samples of white hearth bread added with 10% soy flour A and B received scores of 17.4 points and 17.7 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 white hearth bread added with 15% soy flour A and B, who received scores of 16.2 points and 16.4 points because of lower volume, flattened crumb, breakable, lower consistency from chewing, intense coloration shell, dark brown, very pronounced taste and smell.

In conclusion, the most appreciated, according to the scoring, were the samples of white hearth bread added with 5% soy flour A and B with scores of 19 and 19.1 points respectively, then the samples of white hearth bread added with 10% soy flour A and

B with scores of 17.4 and 17.7 points respectively, and the last being the samples of white hearth bread added with 15% soy flour A and B with scores of 16.2 and 16.4 points respectively. It can be observed a decreasing in scores with increasing the percentage of added soy flour.

**Compliance with Ethics Requirements.** Authors declare that they respect the journal's ethics requirements. Authors declare that they have no conflict of interest and all procedures involving human / or animal subjects (if exist) respect the specific regulation and standards.

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