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QUALITY ASSESSMENT OF CRACKERS OBTAINED BY USING OF THE FERMENTED PREMIX

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Abstract
The purpose of this research was to obtain a new food, the crackers with sensory and nutritional superior quality, to those obtained by the classical method. The new method is the use of a fermented premix (PF) with nutritional ingredients (fermented sour cream, sugar, palm oil) and flavor (caraway seeds), according to a predetermined prescription. The premix is prepared by mixing wheat flour, cream and yeast, followed by acid fermentation for 24 hours at 30^0 C. Leavening agents used to obtain of the dough are yeast, baking soda and yeast + baking soda combination.
The reference sample (PRD) consisted of crackers prepared in one step by the classical scheme, using only the yeast.
The other three experimental variants of the crackers were produced without (PF) in a single step and with (PF) in two stages, as follows:
Variant 1: crackers prepared without fermented premix in a single step, by use of the yeast + baking soda (PRD + B) combination;
Variant 2: crackers prepared with fermented premix in two stages, using only yeast (PPFD);
Variant 3: crackers made with the fermented premix in two stages, using a mixture of yeast + baking soda (PPFD + B).
Qualitative assessment was to determine physico-chemical functional and sensory characteristics of the crackers - new product achieved only with yeast or a mixture of yeast and baking soda, compared with the reference sample.
Determination of physico-chemical characteristics was conducted on the fermentation dough (moisture, temperature, acidity) and crackers - finished product (moisture and alkalinity). Functional properties respective, thickness and content of the broken biscuits with burns, blisters or voids were evaluated on the finished product.
Sensory characteristics were evaluated in according to current reglementations, using the method of the 5 point scale, with weighting factors. For to obtain the total score summed the weighted average scores given to each evaluated characteristic (appearance, texture, smell, taste and behavior to mastication).The groups of the three untrained panelists was formed and trained conform STR 3196-83.
The total scores obtaining for the evaluated samples by the sensory analysis ranged between 17.32 and 19.72.
The results of physico-chemical and sensory evaluations show that crackers produced with fermented premix and the addition of baking soda are the one superior quality product.

Keywords: crackers, fermented premix, physico-chemical and sensory characteristics.

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1. INTRODUCTION

The conditions of contemporary society, lifestyle and high intensity with which people perform their everyday activities, leading to changes in their eating behavior. The snacks between meals have become more frequent and more important for the population, thus explaining the increased growing up consumption of the bakers and pastry.
Crackers are appetizer biscuits eat frequently as substitutes for bread (Manley, 1991), at various times of the day, accompanied by various vegetables and preparations of meat and fish.
Generally, crackers contain a very small amount or no sugar, but contains moderate or high amounts of fat (Hoseney, 1986). Depending on the type of crackers, they can be salted, flavored and sprinkled with fat after cooking (Manley, 1991, 2001).
Almost every country has its own term for this product obtained after their own recipes. In the Netherlands the biscuits are called "rusk" in France "biscotte'' and in German "zwieback", "keks" or "kels." In England and Australia uses the term "biscuit" and in Spain "galletas''. In Italy there are several names for the biscuits, "amaretti" and "biscotti". (Harkin Wm. T

1981,, Zydenbos S, Humphrey-Taylor V 2003, www.deliciousmagazine.co.uk,www.ecurry.com/ blog/starters-snacks/onion-crackers).
The new product obtained under this work is quality superior to classic crackres from nutritional point of view, due to its quality nutrients and sensory characteristics: pleasant aroma, intense, especially given from sour cream and caraway seeds rich in volatile essential oils.
The sour cream use brings to crackers the nutritional intake through its contains in proteins, saturated fats and minerals. The palm oil part to increase the nutritional value of the product, due to of the essential fatty acids (linoleic acid 5-11%, oleic acid 40-52%), A and E vitamins content (Răşenescu, Steel, 1987). Also, caraway seeds have curative properties and provides numerous health benefits (Bewley, Black, Halmer, 1990).
Fermented premix is a biologically active preparation which is characterized by a complex microbial ecosystem, mainly represented by yeasts and lactic acid bacteria, whose activity fermentative gives improved digestive properties (Samuel A. Matz, 1991).

2. MATERIALS AND METHODS

The ingredients used in the production of crackers were white wheat flour type 480, compressed yeast, sour cream 12% fat, palm oil in consistent 80% fat, salt, sugar, caraway seeds and baking soda were purchased from the market town of Campina, Prahova - Romania.

Premix formulation

Wheat flour (400 g), sour cream (200 g) and baking yeast (10 g) were mixed in a Hobart mixer for three minutes at an average speed. This material was placed in a plastic bowl and subjected to fermentation in a thermostat at 28^0 C for 24 hours.

Preparation of crackers

The dough in experimental variants without (PF), respective (PRD) and (PRD + B) contained wheat flour (400 g), sour cream (200 g), sugar (20 g), palm oil (15 g), salt (5 g) and caraway (2 g). Leavening agents are yeast (10 g) and yeast (10 g) + baking soda (5 g). In the samples (PF), (PPFD) and (PPFD + B), at the fermented premix (610 g) was added sugar, palm oil, salt, caraway and leavening agents, in the same amounts as in the previous variants.
After mixing, kneading and fermentation at a temperature of 28^0 C for one hour, the dough was laminated and punching with a circular shape with a diameter of 50 mm. The shapes of the dough was baked in an electric oven at a temperature of 170^0 C for 15 minutes. After cooling biscuits were packed in cans and store for evaluation.

Physical-chemical and functional analysis

The moisture content, alkalinity and defects of crackers were determined according to STAS 1227/3-90. The diameter (D) and thickness (T) of the biscuits after baking were measured using a calliper. The spread ration was estimated by calculating D / T values.
Humidity, acidity and temperature of the dough were evaluated according to technical reglementations for crackers obtaining.

Sensory analysis

The crakers obtained in experimental variants were analyzed after baking conform STAS 12656-88 / SR 3247-84 with 5 points scale method and 6 steps by a group consisting of three untrained panelists as SR 3196/83.
Evaluated sensory characteristics are: appearance, texture, smell, taste and flavor and mastication behavior.
The each described atribute is appreciated with a maximum of 5 points. To obtain the total score is summed weighted average scores obtained by multiplying the average score of each feature by the weighting factor, respective 1.0, 0.4, 0.4, 1.6, 0.6, according to current standard regglementation.
Based on the total score obtained, the products are placed in quality classes such as: Very Good - 19-20 p; Good- 16 to 18.9 p; Satisfactory 14 - 15.9; Unsatisfactory <14 p

3. RESULTS AND DISCUSSION

Physico-chemical characteristics of crackers dough for achieving the 4 experimental variants, respective physico-chemical and functional indices are shown in table 1.

Table 1. Physical-chemical and functional indices of the evaluated crackers

Physical-chemical and functional indices	Evaluated samples				Allowable values
	PRD	PRD+B	PPFD	PPFD+B	
Dough humidity (%)	28,5	26,5	28	26	26-29
Dough temperature (°C)	21	26	22	27	20-25 26-30
Dough acidity (Degree of acidity)	3,7	2,7	3,8	3,1	NS
Moisture of crackers (%)	5,1	4,8	4,9	4,7	Max, 5,00
Alkalinity of crakers (Degree of alkalinity)	0,5	0,9	0,8	1,0	Max. 1,00
Thickness of crackers (mm)	6,37	6,12	6.52	7,38	NS
Diameter of crackers (mm)	65,0	60,0	77,0	79,0	NS
Spread ratio (D/T)	10,2	9,8	11,8	10,7	NS
Crackers defective (%)	2,33	3,33	2,66	2,00	NS

PRD = The reference sample with yeast
PRD+B = The reference sample with yeast + baking soda combination
PPFD = The sample with fermented premix with yeast
PPFD+B = The sample with fermented premix with yeast + baking soda

The results of the physico-chemical characteristics of dough (moisture, temperature, acidity) are between in the range allowable values. The dough acidity of crackers, unspecified as standard indicator is between of 2.7 in the variant without fermented premix and with mixed leavening agents (PRD + B) and 3.8 in variant with fermented premix only with yeast (PPFD). It is noted that the acidity is lower dough prepared with mixed leavening agents variants, which is an expected result.

The moisture crackers with except the reference sample is included below the maximum of 5% and alkalinity not exceed the maximum of 1.00 degrees of alkalinity.

The spread ratio (D / T) of crackers record after baking in the variants produced without fermented premix decreases in the case of the addition of baking soda (PRD + B) in relation to the reference sample (PRD). The same trend of decrease is observed in the variants made with fermented premix, although the amount of leavening agents is higher, probably due to interaction of the substrate, and leavening agents or between the two leavening agents.

Defective crackers content (%), increase in variant (PRD + B) in relation to reference sample (PRD), the explanation being that the addition of baking soda fragile structure of the biscuits.

In the case of obtained variants with fermented premix, the lowest content of the defective biscuits (2%) was recorded in the variant (PPFD + B).

The obtained data show no significant differences in physico-chemical and functional indices and thus sensory analysis will detect which variant of the crackers meets panelists preference in terms of appearance, texture, smell, taste andmastication behavior.

Sensory analysis of the crakers

After completing the individual assessment sensory sheets, the lider of the panelists group centralizes the data obtained for each type and achieved classification into quality classes listed in figure 1.

The assortments of crackers obtained with fermented premix recorded higher values than those prepared without fermented premix, being nominated in the category of ,,very good'' to classic variants, irrespective of the leavening agents use.

After sensory analysis performed, according with total scores obtained for each of the samples, it can be concluded, that the superior product in terms of sensory quality is the crackers produced with fermented premix and the addition of mixed leavening agents

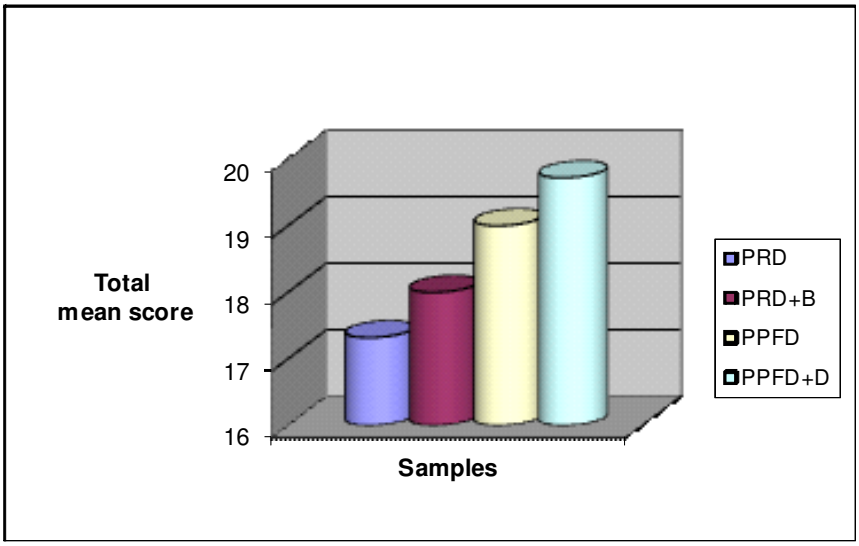

Fig 1. Centralized recording results of sensory analysis of crackers

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4. CONCLUSIONS

After evaluation physical-chemical and sensory characteristics of the assortments of crackers considered in the experiment, can be drawn the following conclusions:

Using a biologically active preparation, respective fermented premix with yeast had positive influence on all functional characteristics (thickness and crakers containing defects) compared to reference samples. The optimal variant of this view was found in crackers assortment in which was used mixed leavening agents.

The investigation of the sensory characteristics of crackres assortments allows us to conclude that the addition of fermented premix has decisive influence on total sensory quality of the crackers, two variants recording the best results being classified as ,,very good'' quality.

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