

RESEARCH ON THE QUALITY OF ORGANIC BAKERY PRODUCTS COMPARED TO CONVENTIONAL ONES

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Abstract

In the last decade, consumers have become more and more concerned about a healthy lifestyle, this thing leading also to choosing the organic bakery products, including organic bread. As a final product, bread is the most consumed food in the world, it being an important source of carbohydrates. The advantages of bread consumption include the lack of nutritive additives and the fact that ingredients are not contaminated with various chemical substances and also the fact that it features a high nutritional value. The aim of this experiment is to evaluate the quality of organic bakery products compared to the conventional ones starting from the establishment of the manufacturing recipe for obtaining organic bread and conventional bread, the establishment of the technological processes used (the direct or indirect method for obtaining the dough), the shape in which the finite product is obtained (round or by tray) and the testing of physical-chemical and organoleptic quality of the finite product. Each finite product is evaluated by using the indicator " Bread note " which reflects its overall quality. The effectiveness of these methods was also compared, being observed the fact that the direct method is more convenient for time-production, but inferior regarding the flavor, taste and the texture of the finite product in which the indirect method was used and organoleptic properties of organic and conventional finite products are influenced also by the form in which they are obtained (round and by tray).

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1. INTRODUCTION

The requirements of consumers regarding "healthy foods" have determined an increase on market value by increasing the range of products, including ecological ones. Although organic foods are almost 50% more expensive than conventional ones, their consumption is increasing due to the fact that the aim is to educate the consumer through various ways, in order to choose the beneficial products for health (Nediţă, G. et al., 2003).

An organic product is a certified product which contain at least 95% ingredients of organic origin and it is distinguished by the absence of chemicals and its nutritional quality (Nediţă, G. et al., 2005).

Organic bread represents the most wide-spread organic bakery product because of its content of carbohydrates, minerals, fibers, amino acids, lipids, etc. The quality of organic bakery products certifies the fact that the wheat was cultivated without chemical fertilizers and without insecticides, and the bread is obtained from organic flour, spring water, yeast, salt

and it does not contain leavening agents or other E numbers (Heaton, S, 2001).

Organic bread has also a stronger flavor, respectively a better taste (Annett, L.E. et al., 2007), a smaller loaf volume, more "dense" texture, smaller air cells in the appearance of the crumb and no differences between color attributes (Annett, L.E. et al., 2008).

2. MATERIAL AND METHODS

The materials used in this experiment are represented by:

- flour (organic and conventional) - it is sieved and dosed according to the recipe;
- bran (organic and conventional) – it is dosed according to the recipe;
- yeast- it is dosed and emulsified;
- sea salt / iodate salt – it is dosed according to the recipe;
- the water used was conventional water (for conventional bread) and mineral water (for organic bread).

Table 1: The manufacturing recipe used in the production of bread by the indirect method

Conventional bread	Organic bread	Leaven	Dough
			250 g leaven
White flour type 650 (g)	Organic flour type 650 (g)	300	750
Compressed yeast (g)		20	5
Iodate salt (g)	Sea salt(g)	-	20
Conventional bran (g)	Organic bran (g)	50	-
Conventional water (ml)	Mineral water (ml)	1000	400

Table 2: The manufacturing recipe used in the production of bread by applying direct method

Ingredients	Conventional bread	Ingredients	Organic bread
White flour type 650 (g)	950	Organic flour type 650 (g)	950
Conventional bran (g)	50	Organic bran (g)	50
Compressed yeast (g)	20	Compressed yeast (g)	20
Iodate salt (g)	15	Sea salt (g)	15
Conventional water (ml)	600	Mineral water (ml)	600

In the experiment the direct and indirect methods of obtaining the dough were used through the whole process. With the direct method, all raw materials have been prepared and dosed according to the recipe, forming the dough directly. The indirect method of obtaining the dough is characterized by the implementation of an intermediate stage in which the leaven is obtained and fermented, in which inductives of final compounds are formed with positive function regarding bread quality. To obtain conventional and organic bakery products with round shape and by tray using the direct and indirect methods, the following manufacturing recipes have been established (Table 1 and Table 2).

For the manufacturing of bread, by the indirect method, a two-phase process (leaven and dough) was applied: the leaven was prepared using flour, water, yeast and bran, dosed according to the recipe.

Leaven fermentation was carried out for 1-3 hours, at 30°C-35°C; the dough was made from fermented leaven and the remaining flour, yeast, water and salt.

For obtaining the finite products, in the case of both types of methods, the following steps were similar:

- the fermentation of the dough lasted for 30 min. 30 ° C;
- the division of the dough was made by separating it in pieces of approximately 600 g, followed by its rest for 8-10 min .;
- the moulding is the operation of forming the blank corresponding to the final form of the product (elongated shape by tray or round shape);
- the final leavening fermentation was carried out in the manufacturing room, with the product placed in the baking tray, at a temperature of around 30-35 ° C;
- baking was carried out at 240 ° C for 40-50 min .; towards the end of the leaving and baking, the process was assessed from the sensory point of view; the baking was carried out in round shapes and by tray.

3. RESULTS AND DISCUSSION

The results obtained from the laboratory analysis of organic and conventional breads derived from the indirect method are presented in Table 3, and following along in Figure 1, are described the organic breads in round shape and by tray, obtained from the indirect method.



Fig. 1. Organic breads, round shape and shape by tray, obtained from the indirect method

Table 3: Physical-chemical indicators of conventional and organic bread obtained from the indirect method

Indicators	Conventional bread at tray	Organic bread at tray	Round conventional bread	Round organic bread
Nominal weight (g)	520	519	504	516
Volume (cm ³ /100g)	388	395	400	400
Porosity (%)	70	72	82	80
Elasticity (%)	92	97	95	95
Acidity (degrees)	1,6	2,2	1,4	1,4
Moisture (%)	42,1	43	38,0	40,2
Bread Note	90	89	97	95
- volume	23	23	24	24
- lateral cracks	6	5	17	6
- crust color	5	5	6	6
- bread-crumbs color	10	10	10	10
- porosity	15	16	19	18
- texture	19	18	19	19
- flavor	12	12	2	12

From the experiments carried out by the indirect method for obtaining the bakery products, according to Table 3 we can observe the following:

- the volume of the obtained bread is within the permissible values (S.P. 3232-97, 300 cm³ / 100 g), for all the experimental variants;
- the porosity records at tray lower values in the conventional bread (70%), opposed to the organic bread (72%), and for the organic bread with round shape of 80% and for the conventional one with round shape of 82 % (the optimum value being 74%, S.P. 3232-97);
- the rate of elasticity, moisture and acidity of the bread-crumbs are within the permissible limits according to the standards S.P. 3232-97,

where the conditions for admissibility and physical-chemical properties of the bread are being specified. The optimal value for the elasticity of white bread is 95%, the maximum for moisture is 44%, and we have a maximum of 3 degrees for the acidity;

-the bread obtained in round shape, both conventional and organic, is well developed, with well loosened bread-crumbs, without clumps of flour; the pores are fine and uniform, the flavor and taste are pleasant, the crust is golden-yellow, browned; the bread notes being 95 for the organic bread and 97 for the conventional bread;

-the bread obtained at tray, both organic and conventional, by the indirect method, has lower

organoleptic properties as opposed to the round bread: pores with thick walls, equally distributed, the bread-crumbs showing harshness when touching and chewing. The bread notes are measured for a total value of 90 for the conventional one and 89 for the organic bread.

The results obtained on the laboratory analysis of organic and conventional bread by the direct method are presented in Table 4, Figure 2 shows round organic bread and sectional, obtained by using the direct method.

From the experiments carried out by the direct process for obtaining the bakery products, according to Table 4 we can observe the following:

-the bread obtained in round shape has volume

values of 234 and 225 cm³/100g and porosity of approximate 64% which is much lower than the standard values according to S.P. 3232-97. The optimal value for the white bread volume is at least 300 cm³/100 g, and for porosity the minimum is 74%;

-the values for moisture, elasticity and acidity fall into the acceptable limits, in all experimental variants;

-the bread at tray, both conventional and organic one, by the direct method, has superior properties as opposed to the round bread: suitable volume, regular shape, browned and elastic crust, without tearing, increased, elastic and loosened kernel, with a light color, with thin pore walls, tasty and with a pleasant flavor.



Figure 2: Round organic bread, obtained by the direct method (section)

Table 4: The values of physical-chemical indicators for organic and conventional bread, obtained by the direct method

Indicators	Conventional bread at tray	Organic bread at tray	Round conventional bread	Round organic bread
Nominal weight (g)	532	512	559	576
Volume (cm ³ /100g)	337	345	234	225
Porosity (%)	82	80	64	65
Elasticity (%)	97	97	87	85
Acidity (degrees)	0,8	0,8	1,5	2,6
Moisture (%)	43,4	44	43,6	43,7
Bread note	90	91	81	80
- volume	20	21	17	16
- lateral cracks	6	6	5	5
- crust color	5	5	5	5
- bread-crumbs color	10	10	10	10
- porosity	18	18	14	14
- texture	19	19	18	18
- flavor	12	12	12	12

4. CONCLUSIONS

The direct and indirect methods for obtaining the dough, do not influence the physical-chemical quality of the organic and conventional finite products (nominal weight, volume, porosity, elasticity, acidity and moisture), but only their organoleptic quality, the direct method being more convenient for time-production, but inferior regarding the flavor, taste and the texture of the finite product in which the indirect method was used.

Organoleptic properties of organic and conventional finite products are influenced also by the form in which they are obtained (round and by tray).

Therefore the final organic and conventional products obtained by the indirect method at tray had been found to exhibit lower organoleptic properties in relation to the breads in round shape. Organic and conventional final products obtained by the direct method at tray showed superior organoleptic properties against the breads at tray formed by indirect methods, as evidenced by the notes obtained in these products.

In order to obtain a satisfactory finite product in terms of physical-chemical and organoleptic procedure it is recommended to use the indirect method and to obtain it in round shape.

Organic finite products, regardless of the shape and method of obtaining, exhibited physical-chemical and organoleptic qualities slightly lower than conventional products, their main advantage for human health being represented by the quality of the ingredients and their nutritional intake.

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