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QUALITATIVE ASPECTS ENCOUNTERED IN OBTAINING SPECIALITY BREAD WITH OLIVE

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ABSTRACT

The complexity of the process of obtaining bread is given on the one hand by the need to use a quality raw material and auxiliary materials with the appropriate Stas parameters but also to lead the technological process of obtaining with maximum rigor. In this study, two types of bread were made that have as a common element the vegetable raw material - olives: wholemeal bread with olives and white bread with olives. The two types of bread will be qualitatively analyzed in terms of general appearance on the outside and in section, smell, taste and color and physico-chemical by performing physico-chemical laboratory analyzes (determination of moisture, acidity and porosity) to determine nutritional values of each assortment studied.

INTRODUCTION

The aim of the bakery is to transform the flour, to add other ingredients (yeast, salt, malt, milk, fat) may be added into a food easy to prepared , through alcoholic fermentation and baking operations. Alcoholic fermentation is a clear step to understand the crucial role of amylases (Dragomir 2006, Godon 1991 citated by Căpruciu 2013). The category of auxiliary materials includes materials used to improve the taste and increase the nutritional value of products, which include sugars, fats, milk and milk by-products, eggs, dietary fiber, vital wheat gluten, spices, seeds on the surface of the products. (Lee et al. 1998, Banu et al. 1999, Yean 2013, Amanat et al. 2010). Quality of raw materials, materials, packaging, etc. it is verified by control and by specific laboratory analyzes, and their reception is performed only if they are accompanied by quality attestation documents (Evelyn et al. 2016, Gomez et al. 2011). Rheological properties of dough are very important in bread baking quality. Knowledge of the rheological behavior of bread dough is very important to understand mechanical properties of the dough and control finished products (Mirsaeedghazi et al., 2008). To produce bread with good volume quality, two factors should be considered: (a) Dough should have a high viscosity to prevent gas cells rising and (b) dough should remain extensible at high level to prevent sudden breakage in gas cell membranes (Li et al., 2003, Sliwinski , 2004). Obtaining bread involves several stages, three of which are more important from a biotechnological point of view: kneading, fermentation of the dough obtained by kneading and shaping the bread, baking (Resmeriţă et al. 1998).

MATERIAL AND METHODS

In order to perform the sensory examination, aspects regarding the condition and appearance of the core, its exterior, aroma, taste, signs of microbial alteration were followed. The external appearance was analyzed by visual examination of the whole pieces of bread, following the shape, surface condition, appearance and color of the crust. The structure and appearance of the core were checked by examining the bread in section. The thickness of the upper and lower shell, the general appearance of the core (uniform, if it shows traces or lumps of flour), the color of the core (white, yellowish, gray, uniform) were observed. The porosity structure was determined by tracking the pore size and the uniformity of their distribution on the surface of the cut. The condition and appearance of the core was checked by examining the elasticity, for which purpose, after cooling, the bread was cut in half and then lightly pressed with the finger on the core, so as not to destroy the pore structure. At the same time, it was checked whether the core is dry to the touch, does not crumble, and the pore structure is normal. The aroma and taste were checked by smelling the core and tasting both the core and the peel of the product. For their assessment, the whole samples were examined and then their core was cut and examined. The aroma was determined by smelling the core.

Humidity determination was performed using the oven determination method. Necessary equipment: thermoregulatory oven, weighing ampoules, technical balance with a precision of 0.01g. How to work: approx. 5 g of the analysis sample, the bread sample vial was placed uncovered in the oven heated to 130^0 C and kept for 60 minutes. Remove the ampoule from the oven and place in the desiccator containing $CaCl_2$ after cooling to room temperature (30 - 60 min) then weigh the ampoule to the analytical balance. Appropriate calculation method was used. The determination of acidity was performed by titration with 0.1 n NaOH solution in the presence of phenolphthalein as indicator. Appropriate calculation method was used. The determination of the porosity of the bread specialties consisted in determining the total volume of the gaps in a known core volume, knowing its density and mass. Appropriate calculation method was used. The difference between the results of two parallel determinations carried out by the same operator within the same laboratory must not exceed two percent volume, in absolute value.

RESULTS AND DISCUSSIONS

The realization of some bakery products based on two types of flour: wholemeal and white on demand, black olives are added as well as their behavior from a technological and nutritional point of view, is the subject of this study. In order to achieve the proposed objective, two bread specialties were made: wholemeal and white with olives, these products being analyzed from an organoleptic and physico-chemical point of view in order to establish their quality. The manufacturing recipe for the two bread specialties is identical, following whether there are any changes in the quality of the dough and the finished product in similar temperature and humidity conditions during the kneading, leavening and baking processes. The products thus obtained are differentiated from each other by their external appearance and section, by volume, porosity, shell color, etc. These differences are due either to the assortments of flour used or to the composition of the dough (addition of olives). The manufacturing technology (on the hearth or in the oven: on the tray) also contributes to the definition of each type of bread analyzed. The steps followed in order to make the wholemeal bread with olives specialty consisted of going through the following

stages of production: all the ingredients were brought to the worktop, at a temperature of 30°C, 1 hour before the start of the process. The mayonnaise was formed: in a special bowl was placed 30 g of yeast to which was added 100 g of fermentable sugar, 300 g of wholemeal flour and 140 ml of water at a temperature of 40°C. All these ingredients were mixed and kneaded for 5 minutes. The vessel was sealed and kept at 40°C until the composition of the vessel reached the lid. The next step was to weigh the olives. The olives were mixed with a part of the flour destined to form the dough in which the mayo was added. The flour brought to the hot at least 1 hour before the dough is formed is placed in a larger bowl over which the previously formed mixture is added. The actual kneading process takes place, which lasted for 15 minutes. Halfway through the kneading time, the salt was added in the mass of the dough being kneaded. Thus formed, the dough was leavened, in a room with a temperature of 50-60°C, until the moment when the dough reached twice the initial volume, the period being about 1 hour. After leavening, the formed dough is divided into two equal parts and is shaped. After modeling, the dough pieces were handled as follows: for the electric oven baking method, the dough pieces thus formed are placed in trays where they are left for another 10 minutes for the final fermentation at a temperature of 50-60°C, after which it were placed in the oven. For the method of baking on the hearth, the pieces of dough were placed directly on the hearth, at a distance of 20 cm from each other, in order to avoid organoleptic defects. When baking in an electric oven, where the temperature was controlled, the dough was initially kept at a temperature of 80°C in order to complete the fermentation process of yeasts with total removal of carbon dioxide which resulted in the rheological formation of the dough. For 15 minutes at 80°C the dough increased in volume. After 15 minutes the temperature was raised by another 20°C, for 10 minutes, to complete the baking process, during which time the core was baked and the color of the shell was formed. The bread thus formed was removed from the oven, left in the trays for 5 minutes to facilitate its removal. The last step was to gradually cool the bread until inside the core, the temperature recorded was similar to the room temperature (about 4 hours after removing from the oven). The steps followed in order to achieve a specialty of white bread with olives are identical as in obtaining the specialties of wholemeal bread with olives. Following the physico-chemical laboratory analyzes (table 1) there are differences by the quality of the bread specialties analyzed according to the baking method.

Thus, in terms of acidity, it is found that the specialty of white bread with olives has a much lower acidity than the specialty of wholemeal bread with olives. This aspect is due to the composition of wholemeal flour, richer in substances than white flour. From this determination it can be said that the specialty of white bread with olives is suitable for a longer storage period, than the specialty of wholemeal bread with olives. regarding the acidity, even within the same type of specialty, the differences not being very big. For example, the white bread specialty with olives baked on the hearth has a higher acidity than the white bread specialty baked in the electric oven (3.8 compared to 3.6ºThörner). The proportion is also maintained in the case of wholemeal bread specialty, the acidity degrees being higher (5.4 ºThörner acidity for wholemeal bread with baked olives on the hearth and 5.3 degrees Thörner acidity for wholemeal bread with baked olives specialty electric).

Table 1

Physico-chemical properties of wholemeal and white bread specialties with olives

Specialty	Baking method	Acidity (ºThörner)	Humidity%	Porosity %
Wholemeal bread specialty with olives	On the hearth	5,4	51,8	80
	In the electric oven	5,3	53,6	63
White bread specialty with olives	On the hearth	3,8	42,9	61
	In the electric oven	3,6	43,8	58

And the determination of humidity highlights the specialty of wholemeal bread with olives, the one baked in electric oven having the highest humidity (figure 1). It is closely followed by wholemeal bread baked on the hearth (51.8%). Regarding the white bread assortment, the humidity recorded in the core after baking and cooling is lower than in the other assortment, the differentiation being made in this case as well depending on the baking method (42.9% per hearth and 43.8% in the electric oven). Determining the humidity as well as the acidity shows that the specialty of white bread with olives is kept for a longer period of time. The determination of porosity in the bread industry is an important indicator of quality. The higher the porosity values, the denser the bread core will be, this element being a minus point when chewing (aspect also found in the research of Li et al., 2003).

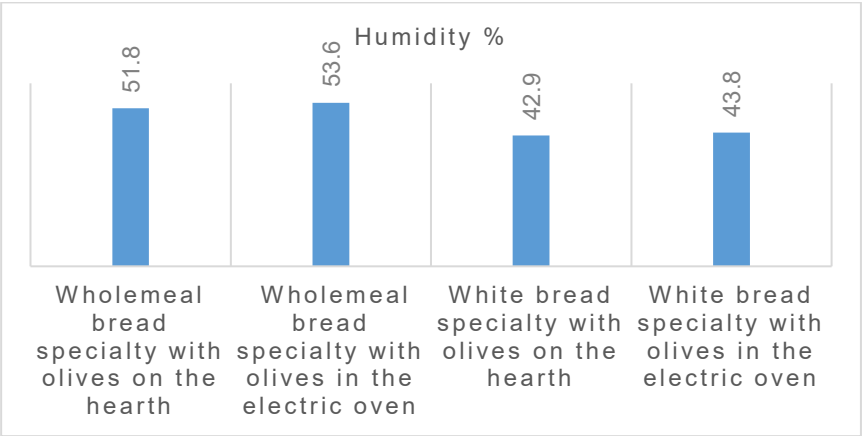

Figure 1. Determination of the humidity (%) of the core of the studied bread specialties

Figure 2 shows that the specialty of wholemeal bread with olives baked in the electric oven represents the lowest percentage of porosity, the dense appearance of the core being observed following organoleptic determinations, the volume being flattened.

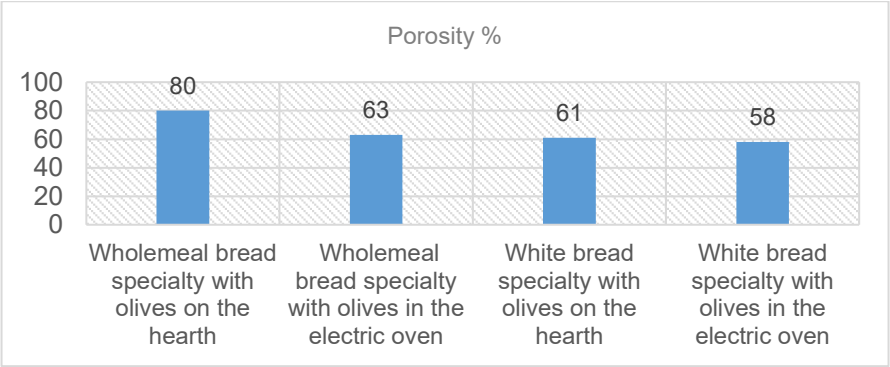

Figure 2. Determination of porosity (%) of bread specialties studied

At the opposite pole is the specialty of white bread with olives baked on the hearth with a high percentage of porosity, which led to a core with large pores, visible through the uneven gaps in the core section. Satisfactory percentages presented the specialty of white bread with baked olives in the electric oven (68%), being followed by the specialty of wholemeal bread with baked olives on the hearth (60%).

CONCLUSIONS

Following the organoleptic determinations for the two bread specialties studied, it is found that the baking method influences the final quality. From the point of view of taste and smell, the specialty. From the point of view of taste and smell, the specialty of intermediate bread baked on the hearth with olives has a higher quality,, followed by the same type of specialty baked in electric oven, the specialty of white bread with olives baked on the hearth on the last place being the specialty of white bread with olives baked in an electric oven.

From the point of view of appearance, the specialty obtained on the hearth showed more defects than the baking system in the electric oven. Thus, the wholemeal bread specialty obtained on the hearth showed visible external cracks, which are missing when baking in an electric oven. Also, the specialty of white bread with olives presented lateral cracks of the crust when baking on the hearth, while the one obtained in the electric oven had a uniform appearance.

Interesting differences within the same type of specialty obtained by different baking methods are also observed in terms of volume. It is found that the specialty of wholemeal bread with olives had a smaller volume than the specialty of white bread with olives, and from the point of view of baking, the one obtained on the hearth had a smaller volume. Different aspects were also found in terms of porosity, as follows: in the specialty of wholemeal bread with olives obtained on the hearth, the pores were very small, obtaining a dense porosity; in the specialty of white bread with olives obtained on the hearth, the pores were large, obtaining a high porosity; in the specialty of wholemeal bread with olives obtained in an electric oven, the pores were of medium size, the core having a medium density porosity; in the specialty of white bread with olives obtained in electric oven the pores had normal dimensions, giving a normal density of bread which led to a normal, characteristic volume.

Regarding the acidity, it is found that the specialty of white bread with olives has a much lower acidity than the specialty of wholemeal bread with olives, being able to conclude that the first assortment is suitable for a longer storage period and

slicing. It is also found that the way of baking the bread specialties studied, makes differences in terms of both acidity and moisture and porosity even within the same type of bread, the differences being very large in some cases.

The determination of humidity highlights the specialty of wholemeal bread with olives baked in an electric oven, closely followed by the specialty of wholemeal bread with olives baked on the hearth, assortments that are proposed for immediate consumption, increasing the shelf life leading to their rapid depreciation.

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