

## **STUDIES REGARDING THE UTILIZATION OF THE PAIR MACERATION EXTRACTS FOR THE OBTAINING OF BREAD**

**Rosan Cristina Adriana\***

\* University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048  
Oradea; România, e-mail: crosan@uoradea.com

### **Abstract**

*Bakery still remains an open subject for researchers, because, the science in the field of food industry evolves, were found new techniques of bread manufacture, of its baking and also, is tested the effect of different additives on the quality of bread or its obtaining from different types of known flour known or less known on the market, introduced in different percentages and with different agents of fermentation. In the context of those said this study proposed to replace the classic agent of fermentation (beer yeast) with an usual pair maceration extract, in three experimental versions (white flour, rye flour, flour of spelt introduced in different percentages) and the organoleptic evaluation and of the freshness in time of the obtained products.*

**Key words:** maceration extract, rye flour, spelt flour, pairs

### **INTRODUCTION**

The bread is one of the basic food of the human kind, being indispensable for the daily alimentation, due to its nutritional properties and of the content in substances producing thermal energy. This important food was and is a permanent preoccupation of the people from the oldest times (Banu C, 2000).

The bakery, respectively the activity related to the obtaining of the bakery products, represents one of the oldest occupations from our country and also one of the major components of the food production. Due to the fact that the bread is a main food, that is consumed daily, its production, together with that of the other foods, was always an essential preoccupation of our society (Banu C, 2009).

Applying the adequate recipes and technologies, by the utilization of the flour as basic raw material, the bakers obtain a diverse range of products, with the purpose of satisfying the increasing and diversified demands of the population (Bals C., 2012).

In the present, there is the idea, completely wrong, that the bread and the bakery products makes you fat. These products are very rich in nutrients, but are not rich in calories (Jurcoane Șt., 1995).

The 1995 edition of the Diet Guide for Americans recommends the introducing in the diet of approximately 6 up to 11 sorts of bread, cereals, rice and pasta. These products are a valuable source of complex carbohydrates (especially amyllum), fibers, iron and vitamins from B group, having also a decreased content of fats (Bei M. F. et.al. 2014). Also we have to consider that the volume of the consumption has to be small, a loaf of bread or a sandwich being enough for a meal.

The diet guide recommends that the daily input of calories should come in proportion of at least 55 – 60% from carbohydrates, less than 30% from lipids and approximately 15% from proteins (Bals C., 2012).

Also the bread is a very good source of vitamins from the group B: thiamine, riboflavin, niacin and folic acid in the conditions in which the flour from which it is obtained is enriched (Bei M. F. 2009). The contents of fibers is of approximately 0.5 grams soluble fibers/loaf, that is a daily input of approximately 20-35 g. These fibers have an important role in reducing the level of cholesterol from the blood (Popovici R., 2008).

The other sorts of bread have an approximately similar input, depending on the raw materials used and the sort. Because in Romania the enriching of the flour is not a widely spread practice it is indicated to use on a large scale the flour of large extraction and of the integral flour (Jurcoane Șt., 2004).

In the context of those mentioned, this study proposed the finding of some alternatives of bread manufacture by replacing the yeast, the effects that the potential substituents are producing on the sensory quality and on the period of preservation of the bread and the evaluation of the behavior of different types of flour under the influence of this maceration extract.

## **MATERIAL AND METHODS**

The maceration extract of pairs is obtained from fruits chosen so that they have a great content of carbon hydrates in the form of sucrose, glucose and fructose. The breed of pairs chosen was Williams. These were washed, cut in quarters or placed in glass jars and then was added water until it covered the fruits from the jar. In order to obtain a quality maceration extract, the quantity of fruits has to be approximately equal with that of water. The fruits are placed for maceration together with the core and the shanks. The jars were air locked and were placed in the light, heat and sun so that in a few days they can ferment.

After they begin to ferment, you can control the power of fermenting as the following: is mixed the maceration extract of fruits with flour, in equal quantities and is left for a few hours at a temperature equal with that of fermentation of the proper dough.

If the volume of the mixture of maceration extract with flour is doubling the volume it can be used for the preparing of the dough, because the power of fermentation is optimum. If the optimum time of maceration is crossed, the mixture of fruits and water will be sour and cloudy, which is not wanted for the preparing of the bread.

The preparing of the dough was made by the direct method that consists of the mixing of all the ingredients in the beginning of the operation, is began the operation of kneading of them. To accomplish the proposed study were used 3 types of flour in different percentages and versions of experiment (white, of rye and of spelt), maceration extract of pairs and salt. Thus, were accomplished 3 experimental versions: white flour 100%, white flour+rye flour in proportion of 1:1, white flour+spelt flour in proportion of 1:1.

The samples were kneaded approximately 8-10 minutes, until the formed dough was detached of hands and from the margins of the kneading bowl, was left for fermentation approximately 40-60 minutes at the room temperature of 28-30°C. At the end of the rest period, the dough needs to have the volume doubled or triple, this representing an indicator on the quality of the obtained maceration extract.

The dough is kneaded again, which takes lesser time than the proper kneading and is place in form of baking and afterwards is left again for fermentation (the same time and temperature as the initial fermentation). When the dough increased until the margin of the form, is varnished and is introduced in the previously heated oven at the temperature of 250°C in the first 20 minutes, and then is reduced the temperature at 200°C for 20-30 minutes more. After the baking is varnished again. For the sort of bread in mixture of wheat white flour with rye flour and that of white wheat flour with spelt flout, the time of baking was more than 5-10 minutes.

## **RESULT AND DISCUSSION**

The assessment of the quality of the bread was accomplished on the basis of the points scheme, standards that provide the minimum conditions that the products have to accomplish in order to be given for consumption. For the quality scaling of the bakery products was introduced the method of appreciation of quality on the basis of a scheme of 30 points.

This scheme included the main qualitative indices of the products, combining the sensory examination with the physical-chemical one. For each of these indicators (the volume, color and aspect of the crust, the degree of baking, the condition and aspect of the core, the porosity of the core, the structure of the pores, the taste, the smell, the strength of the core, the elasticity of the core, the disintegration, the humidity) is given the

maximum points and as the quality decreases the points decrease correspondently.

Table 1

The results of the analysis of the main indicators

The indicators of the product	Characterization		
	White flour	White flour + rye flour 1:1	White flour + spelt flour 1:1
Forma and volume of the product	Increased volume and well outlined, characteristic form of the product.	Form according to the product, increased and outlined, proportional volume to the weight of the product.	Form according to the product, increased and outlined, normal volume, proportional to the weight of the product.
Color and aspect of the crust	Plain crust, yellow-goldish, plain surface, without rugosity, specific to the product.	Plain crust, brownish, plain surface, without rugosity, specific to the product.	Plain crust, dark color, plain surface, without rugosity, specific to the product.
The degree of baking, the condition and aspect of the core	Well baked, uniform core and well stirred, with high porosity.	Well baked product, with the crust a bit too colored, the core according to the product, with acceptable porosity.	Well baked product, with the crust a bit too colored, the core according to the product, with acceptable porosity.
Porosity of the core and structure of the pores	Dense core, with acceptable porosity, with small and dense pores.	Dense core, with acceptable porosity, with small and dense pores.	Dense core, with acceptable porosity, with small and dense pores.
Flavor (smell)	Pleasant, soft of pairs, characteristic to a well baked product, with flavor corresponding to the product.	Pleasant, soft of pairs, characteristic to a well baked product, with flavor corresponding to the product.	Pleasant, soft of pairs, characteristic to a well baked product, with flavor corresponding to the product.
Taste and acidity	Appropriate salty taste, characteristic to the product. Without foreign taste, sour or bitter	Appropriate salty taste, soft pair taste, characteristic to the product. Without foreign taste, sour or bitter	Appropriate salty taste, soft pair and nuts taste, characteristic to the product. Without foreign taste, sour or bitter
Humidity	Product with acceptable aspect and humidity, without excessive humidity.	Product with acceptable aspect and humidity, without excessive humidity.	Product with acceptable aspect and humidity, without excessive humidity.

Table 2

**The results regarding the degree of freshness or ageing of the bread in time**

Experimental versions	Indicators	Period of preservation in time (h)					
		4	8	12	24	48	Total
White flour 100%	taste	4	4	4	4	3	<b>19</b>
	smell	5	5	4	3	3	<b>20</b>
	strength of the core	5	5	4	4	3	<b>21</b>
	elasticity of the core	4	4	3	3	2	<b>16</b>
	disintegration	4	4	3	3	2	<b>16</b>
White flour + rye flour 1:1	taste	4	4	3	3	2	<b>16</b>
	smell	5	5	4	4	3	<b>21</b>
	strength of the core	4	4	4	4	3	<b>19</b>
	elasticity of the core	4	4	3	3	3	<b>17</b>
	disintegration	4	4	3	3	2	<b>16</b>
White flour + spelt flour 1:1	taste	4	4	3	3	2	<b>16</b>
	smell	5	5	4	4	3	<b>21</b>
	strength of the core	4	4	3	3	2	<b>16</b>
	elasticity of the core	4	4	3	3	2	<b>16</b>
	disintegration	4	3	3	2	1	<b>13</b>

**CONCLUSIONS**

A first differentiation appeared during the processing, where at the kneading of the dough, it could be observed the total different behavior of the three types of flour: white wheat flour, rye flour and spelt flour. The dough of rye flour and that of spelt flour needed a larger quantity of water and of fruit maceration extract respectively. After the organoleptic analysis we can say that the fruit maceration gives a flavor and taste characteristic to the fruit, but regarding the other indicators analyzed the witness test is superior from the point of view of the form and volume of the product, the aspect of the crust, the aspect of the core, the porosity and structure of the pores.

From the analyses performed we can say that the type of flour is a defining element in this experiment, we can also say that the versions obtained with maceration extract are acceptable from the organoleptic point of view, these giving the special flavor and taste of the fruit. Regarding the freshness in time of the products we can say that the experimental versions obtained with maceration extract are ageing more quickly compared with the usual bread with yeast because they have a content of water higher due to the rheology of the dough mainly, which allows the elimination of the water during the baking. The bread obtained with maceration extract loses

the specific taste, the smell becomes unpleasant after 24 hours, being intensified to putrid, the bread loses its elasticity and strength of the core, giving thus unfitted signs for consumption.

## REFERENCES

1. Baș C., 2012, Studies regarding the fermentative activity of some sorts of bakery yeast, *Analele Universității din Oradea, Fascicula Ecotoxicologie, Zootehnie și Tehnologii de industrie alimentară*, Noiembrie 2012, vol XI B, ISSN 1583-4301, pag. 301-305;
2. Banu C., 2009, *Tratat de industria alimentară*, Editura ASAB București;
3. Banu C., 2000, *Biotehnologii în industria alimentară*, Editura Tehnică, București;
4. Bei M. F., 2009, *Tehnologia prelucrării produselor agroalimentare și impactul lor ecologic – Ghid practic*, Editura Universității din Oradea, I.S.B.N. 978-973-759-762-5, pg. 192;
5. Bei M. F., Domocoș D., 2014, Analysis of vitamin C content from some vegetables food products commonly used in human food, *Analele Universității din Oradea, Fascicula, Protecția Mediului Vol, XXII, anul 19, I.S.S.N. 1224-6255, pag.65-71, (B+)*, Edit. Universității din Oradea.
6. Donca Gh., 2012, *Mic dicționar de inginerie tehnică pentru domeniul agrozootehnic și agroturistic*, Editura Universității din Oradea, ISBN 978-606-10-0771-4, 312 pg.;
7. Ikura Y. și Horikoshi, K., 1987, *Jurnal of Fermentation Technology*, 65, p. 707;
8. Jurcoane Șt. et. al., 2004, *Tratat de biotehnologie, I*, Ed. Tehnică, București;
9. Jurcoane, Șt. et. al., 1995, *Curs de biochimie și biotehnologia proteinelor și enzimelor. „Proteine”, partea I*. Tipografia USAMV, Timișoara;
10. Kulp K., Reed, G., 1975, *Enzymes in Food Processing*. Academic Press, London;
11. Popovici R., 2008, Resistance and immunity. *Analele Universității din Oradea, Fascicula, Ecotoxicologie, Zootehnie și Tehnologii de Industrie Alimentară* Vol VII, an 7, I.S.S.N. 1224-6255, pag551, , Edit. Universității din Oradea.
12. Wang H.L., Hesseltine C. W., 1981. Use of microbial cultures: legume and cereal products. În: *Food Technology*, 1, p. 79.