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RESEARCHES REGARDING THE QUALITY OF DIFERENT BREAD TYPE

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Abstract

This study try to compare properies of theree bread type using for production diferent kind of flours. The study was conducted in the frame of project HURO 1001/323/2.2.2 Grains Safety during 2015 in University of Oradea. There was made a comparison betwen white bread, rye bread and graham bread. The parameters taken in study were Physico - Chemical properties: mineral content, humidity, pH and Rheological properties: elasticity, porosity.

Key words: wite bred, rye bread, graham bread, humidity, bread acidity, mineral content, porosity, elasticity.

INTRODUCTION

There is an increasing of the replacing normal withe bread from the diet because of alternatives from the market and the actual trend that recomand "healty" nutrition.

Is important to evaluate if the bread of diferent kind have the same or superior properties than withe bread. In this way the study propose to start the investigation about the rye and grahan bread quality compared with normal withe bread.

The parameters taken in study were Physico - Chemical properties: mineral content, humidity, pH and Rheological properties: elasticity, porosity. Methods used for analysis are according with romanian standards and are quottation in latest studys.

MATERIAL AND METHOD

Taking samples: Samples were taken from the sliced bread. We use to take samples for porosity a rectangular probes. Procedure was according to M., Sestraş R., Cordea Mirela, Tehnică experimentală horticolă, Edit. Academicpres, Cluj – Napoca, 2005.

Obteining working samples: We form successively elementar, brutto, homogenized, laboratory and work samples according with Mureşan T., Pană N.P., Cseresnyes Z, 1986.

There were study first organoleptical parameters in order to eliminate from the study the samples that were not according with specifications. If this parameters was out of normal range bread samples were considered out of standards, affected by different kind of degradation and study of those samples was ended.

The parameters taken in study were Physico - Chemical properties: mineral content, humidity, pH and Rheological properties: elasticity, porosity. We use Official Methods of Analysis of AOAC International - 19th Edition, 2012.

The study was conducted in 2015 and had the following methodology.

Samples taken in to study 3 kind: withe bread, rye bread and graham bread.

Number of samples was 5 for each repetition. There were 10 repetitions for each kind of bread. The date of the repetitions are presented in the table below.

Table 1

Experimental plan

Date	Withe bread	Rye bread	Graham bread
14.03.2015	5 samples	5 samples	5 samples
21.03.2015	5 samples	5 samples	5 samples
03.04.2015	5 samples	5 samples	5 samples
15.04.2015	5 samples	5 samples	5 samples
24.04.2015	5 samples	5 samples	5 samples
18.06.2015	5 samples	5 samples	5 samples
22.06.2015	5 samples	5 samples	5 samples
13.07.2015	5 samples	5 samples	5 samples
16.07.2015	5 samples	5 samples	5 samples
29.07.2015	5 samples	5 samples	5 samples

The technology was similar with the proposed by Timar A., Tehnologii generale în industria alimentară, Editura Universităţii din Oradea, Oradea 2010, for all kind of bread.

Production and the laboratory research was conducted in the own laboratory of University of Oradea, Faculty of Environmental Protection, Department of Food Engineering.

RESULTS AND DISSSIONS

All the samples taken in to study had conform organoleptical properties. Results of the research were as following.

Physico - Chemical properties

Table 2

Research results regarding Humidity of bread crumb, %

Date	Withe bread	Rye bread	Graham bread
14.03.2015	36,14	20,22	22,22
21.03.2015	35,73	20,12	22,21
03.04.2015	36,03	20,14	22,20
15.04.2015	36,08	20,24	22,20
24.04.2015	36,01	20,09	22,19
18.06.2015	36,01	20,19	22,19
22.06.2015	35,83	20,23	22,20
13.07.2015	35,92	20,17	22,20
16.07.2015	36,11	20,20	22,19
29.07.2015	36,21	20,27	22,19

According with the results the properties of Rye and Graham bread are similar with the white bread regarding the Humidity of the crumb bread. The parameters are lower than white bread because the gluten retained important water amounts. In this way the nutritional quality of Rye and Graham bread are superior. Regarding the humidity lower percentage in Rye and Graham bread will improuve the self - life of the product because of lower microbiological activity generated by a_w level.

Table 3

Research results regarding Mineral content bread, %

Date	Withe bread	Rye bread	Graham bread
14.03.2015	5.142	5.059	4.602
21.03.2015	5.142	5.059	4.602
03.04.2015	5.141	5.058	4.601
15.04.2015	5.141	5.058	4.601
24.04.2015	5.140	5.057	4.600
18.06.2015	5.139	5.057	4.600
22.06.2015	5.122	5.039	4.612
13.07.2015	5.142	5.059	4.609
16.07.2015	5.144	5.078	4.701
29.07.2015	5.151	5.038	4.671

Mineral content of the crumb bread, % was in all samples similar to withe bread. That is surprised if we considered the way of mineral content

appear because his presence in flour. In this way we sugest that flour quality was not according with the properties from the labels.

Table 4

Research results regarding Acidity of bread, °

Date	Withe bread	Rye bread	Graham bread
14.03.2015	6,53	6,25	6,31
21.03.2015	6,52	6,23	6,29
03.04.2015	6,50	6,24	6,30
15.04.2015	6,51	6,22	6,28
24.04.2015	6,49	6,21	6,27
18.06.2015	6,54	6,20	6,28
22.06.2015	6,51	6,24	6,33
13.07.2015	6,51	6,22	6,28
16.07.2015	6,48	6,21	6,27
29.07.2015	6,54	6,18	6,28

The acidity of the bread was similar to all samples taken in study. That suggest that there are not significant influences from the raw materials in the final products. The values shown that there is no direct corelation betwen the parameter, technology and raw materials.

Rheological properties:

Table 5

Research results regarding elasticity of bread, cm

Date	Withe bread	Rye bread	Graham bread
14.03.2015	0,5	0,8	0,6
21.03.2015	0,6	0,7	0,5
03.04.2015	0,5	0,6	0,5
15.04.2015	0,4	0,5	0,4
24.04.2015	0,4	0,4	0,4
18.06.2015	0,3	0,4	0,3
22.06.2015	0,6	0,7	0,5
13.07.2015	0,5	0,6	0,5
16.07.2015	0,4	0,5	0,4
29.07.2015	0,4	0,4	0,4

The values of this parameter were higher in withe bread, according with the references. There are also some high values in Rye bread that are explained by the technology used that allow a small gluten degradation.

Table 6

Research results regarding porosity of bread, %

Date	Withe bread	Rye bread	Graham bread
14.03.2015	74	66	61
21.03.2015	71	64	62
03.04.2015	72	67	61
15.04.2015	72	65	61
24.04.2015	72	61	62
18.06.2015	71	65	61
22.06.2015	71	63	63
13.07.2015	71	64	63
16.07.2015	73	65	61
29.07.2015	74	66	61

Porosity of the crumb bread, was in all samples similar to withe bread, but lower. That is surprised if we considered the way of porosity appear because the gluten elasticity. In this way we sugest that rheological parameters like viscosity of the dough have much higher values.

CONCLUSIONS

The results shown that alternative kind of bread are similar regarding some properties with withe bread.

The nutritive value because of lower content of water is better than withe bread. This also improuve the conservability of bread, by reducing the microbiological activity caused by high a_w level that can be extrapolated.

There were no evidence of decreasing of rheological parameter - Porosity of the crumb of bread, that allow us to conclude that even in the low percentage of gluten the dough retained enoughh fermentation gases.

Study reveal that is necessary to asses the microbiological activity during shelf - life of the product to confirm hipotesis regarding better conservability because of low water content.

That allow us to considered rye and Graham bread an alternative for Romanian market.

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