Analele Universităţii din Oradea, Fascicula: Ecotoxicologie, Zootehnie şi Tehnologii de Industrie Alimentară Vol. XIII/B, 2014

RESEARCHES REGARDING THE QUALITY OF GLUTEN FREE BREAD

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Abstract

This study try to compare properies of the gluten free bread made using the product "Panmix bread gluten free" from Supremia® company. The study was conducted in the frame of project HURO 1001/323/2.2.2 Grains Safety during 2013 – 2014 in Bicaci milland backery. There was made a comparison betwen white bread and gluten free bread made using the "Panmix bread gluten free" from Supremia® company. The parameters taken in study were Humidity of the crumb bread, Porosity of the crumb bread and Acidity of bread.

Key words: gluten, gluten free bread, bread porosity, humidity, bread acidity.

INTRODUCTION

There is an increasing of the incidence regarding gluten intolerance and strong demands to reduce gluten from the diet because of this and the actual trend that recomand "healty" nutrition.

Is important to evaluate if the bread can be produced at large scale in the gluten free variant. In this way the study propose a receipe and start the investigation about the bread quality compared with normal withe bread.

The parameters taken in study were Humidity of the bread, Porosity and Acidity.

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 cilindrical 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 Humidity of the bread, Porosity and Acidity and in this way we use Official Methods of Analysis of AOAC International - 19th Edition, 2012.

The study was conducted in 2013 - 2014 and had the following methodology.

Samples taken in to study 2 kind:

- withe bread,
- gluten free 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	Gluten free bread
16.01.2013	5 samples	5 samples
27.01.2013	5 samples	5 samples
06.02.2013	5 samples	5 samples
18.03.2013	5 samples	5 samples
27.05.2013	5 samples	5 samples
15.06.2013	5 samples	5 samples
30.08.2013	5 samples	5 samples
04.11.2013	5 samples	5 samples
16.04.2014	5 samples	5 samples
29.04.2014	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, with the addition of "Panmix bread gluten free" from Supremia® company for gluten free bread.

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

All the data were processed by a SPSS software installed on i3 Acer Aspire 5733 laptop.

RESULTS AND DISSSIONS

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

Table 2. Research results regarding Humidity of bread crumb, %

Date	Withe bread	Gluten free bread
16.01.2013	43,00	43,00
27.01.2013	43,80	43,30
06.02.2013	43,50	43,90
18.03.2013	42,70	45,00
27.05.2013	42,90	47,00
15.06.2013	44,00	42,60
30.08.2013	43,60	46,10
04.11.2013	44,30	45,40
16.04.2014	43,90	48,20
29.04.2014	45,00	48,00

According with the results the properties of gluten free 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 gluten free bread are superior. Regarding the humidity lower percentage in gluten free bread will improuve the self - life of the product because of lower microbiological activity generated by a_w level.

In the picture below the values are more clear, gluten free bread had more homogenious

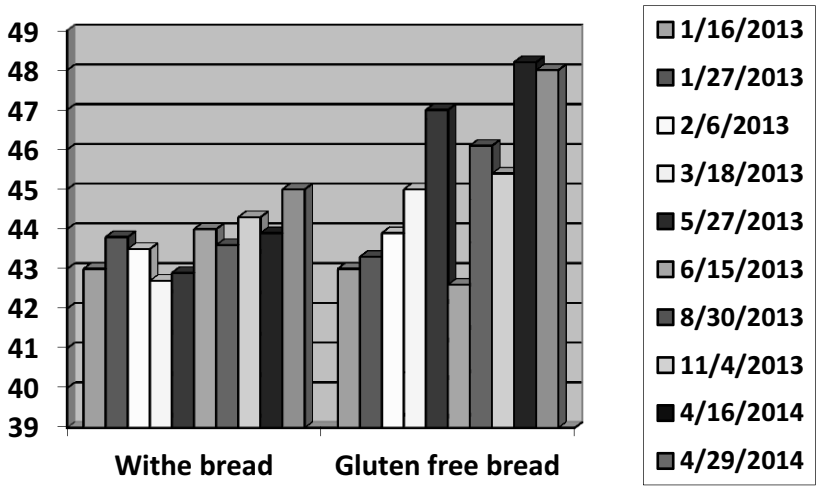

Figure 1. Research results regarding Humidity of bread, %

Table 3. Research results regarding Porosity of the crumb bread, %

Date	Withe bread	Gluten free bread
16.01.2013	72,00	72,00
27.01.2013	73,00	74,00
06.02.2013	71,60	73,80
18.03.2013	72,30	73,00
27.05.2013	74,00	73,30
15.06.2013	74,60	72,90
30.08.2013	73,00	73,00
04.11.2013	73,40	75,20
16.04.2014	75,40	74,60
29.04.2014	75,00	75,00

Porosity of the crumb bread, % was in all samples similar to withe bread. 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 have much higher values.

Table 3. Research results regarding Acidity of bread, °

Date	Withe bread	Gluten free bread	Maximum alowed
16.01.2013	2,00	3,00	3,00
27.01.2013	3,10	2,20	3,00
06.02.2013	4,01	3,19	3,00
18.03.2013	1,90	2,30	3,00
27.05.2013	2,83	3,04	3,00
15.06.2013	2,00	3,00	3,00
30.08.2013	2,80	2,60	3,00
04.11.2013	2,70	2,34	3,00
16.04.2014	4,00	2,50	3,00
29.04.2014	2,00	3,12	3,00

The acidity of the bread was similar to all samples taken in study. That suggest that there gluten free bread have the same properties regarding alteration. The values shown that there is no direct correlation between the parameter, technology and raw materials.

CONCLUSIONS

The results shown that gluten free bread is 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, reducing the microbiological activity caused by high a_w level.

There were no evidence of decreasing of rheological parameter - Porosity of the crumb of bread, that allow us to conclude that even in the absence 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 gluten free bread an alternative for Romanian market.

Acknowledgments

The researches were carried out in the project: HURO/1001/323/2.2.2, GRAINS SAFETY, Researches regarding the influence of some technological elements over the wheat and corn grains quality stored in Bihor and Hajdu Bihar counties Project founded by Hungary-Romania Cross-Border Cooperation Programme 2007-2013 (www.huro-cbc.eu)

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