

RESEARCHES REGARDING THE FIBERS INFLUENCE ON THE QUALITY OF BAKERY PRODUCTS

Vasilica Alisa Aruș, M. Leonte, N. Pircu

¹ *University of Bacău, Department of Chemical and Food Engineering,
Laboratory of Food, Technologies and, Biotechnology, Mărășești Street, no. 157,
RO-600115, Bacău, E-mail morarescualisa@yahoo.com*

Abstract

One of the methods used in order to improve the bakery products consists in the admixture of flour with wheat bran. The alimentary fibres have the property to significantly moderate the cholesterol quantity absorbed from the intestines and thus a rich alimentation based on alimentary fibers offers an important protection against the growth of blood cholesterol. This paper presents the researches regarding the improvement of the content of fibers of some bakery products, by the use in the baking processes of these fibers in different quantities of wheat bran.

Keywords: *fibers, porosity, elasticity, admixture, improvement.*

Introduction

The term fiber describes the parts of vegetal aliments that are not assimilated by the action of the digestive enzymes. The alimentary fibers are a part of the great category of glucides but they are particular in the sense that the alimentary fibers are not digested by the human organism (Ciobanu, 2001 and 2002). They simply seem to be ballast that is eliminated with the other residues resulted from the digestion and fermentation processes that take place in the intestine.

Nowadays, internationally speaking, there is a wide offer of products rich in fibers, as a consequence of the increase of the consumption of bakery products. These products can be easily improved by the use of different types of fibers and another important condition is the fact that half of the daily fibers should be provided by cereals as a source of insoluble fibers (Leonte, 2005, 2006a and 2006b). That is why one made the error of considering that one can live without them.

The bakery industry is going through an intensive program in which one enhances measures taken in order to increase the raw material by the superior use of some cereal resources (Leonte, 2000 and 2001). It is known the fact that in developed countries the first cause of mortality and morbidity is represented by the coronary dysfunction, determined by sub nutrition with excessive lipids, especially saturated ones and by the lack of alimentary fibers. The simplest method of improving the quality of aliments with the help of fibers consists in the admixture of cereal bran or the admixture of bran products in white flour.

This method is technologically simple and speaking from the organoleptic point of view, the consumer seems to be accepting more easily a product in which fibers colour the background as compared to a product that is white.

The alimentary fibers that are not used in great proportions in the bakery industry can be used as far as the demand and the use of dietary products that are rich in fibers have become present and there is an actual demand for them.

Although they are not digested by the enzymes of the digestive tube, the alimentary fibers influence digestion, especially the hydrolytic processes that take place in the stomach and in the thin intestine, and the processes of absorption of the products resulted from digestion.

This influence of the alimentary fibers on the bakery products manifests due to the specific properties such as: the high bonding capacity of water, the increase of viscosity, the bonding capacity of bile salts, and the ion exchange possibility (Leonte, 2004). One aims at improving the quality of consumption bread by the use of alimentary fibers in different proportions. The admixture of alimentary fibers in the bakery products is also useful in the creation of special types of bread, should one establish balanced ratio that should not negatively influence the properties of the products.

Experimental

In order to achieve the experimental program, one used wheat flour, 480 type and natural fibers obtained from wheat bran, Pakmaya yeast, NaCl and water. The dough used for the experiments was

prepared using the direct method, by monitoring the quantities of flour, salt, water and yeast (constants used throughout all the experiments) and the percentage of bran (variable in quantity) (table 1).

The check on the quality of bread meant the physical and chemical analysis (Leonte, 1998) (calculation of acidity, porosity, elasticity).

Table 1. Experimental program

Technological parameter	Sample			
	1	2	3	4
wheat bran admixture,%	0	3	7	10

Results and Discussions

In order to determine the optimum conditions for the obtaining of bread with a different wheat bran admixture is concerned one looked into the following parameters according to Banu (1998) (their values being presented in table 2):

- Acidity
- Elasticity
- Porosity

Table 2. Physical - chemical parameter of bread samples obtained with different wheat bran admixture

Chemical parameter	Sample			
	1	2	3	4
Acidity, °T	2.52	2.67	2.75	2.87
Elasticity, %	96.36	94.78	93.24	92.83
Porosity, %	72.3	68.42	64.35	62.2

In order to be able to appreciate the results of the research, the admixture of wheat bran which is considered as being prevailing in the research, one chose to graphically show the parameters.

The influence of the working conditions expressed in the research program by the wheat bran admixture affecting the bread quality was graphically expressed in the following figures 1 - 3.

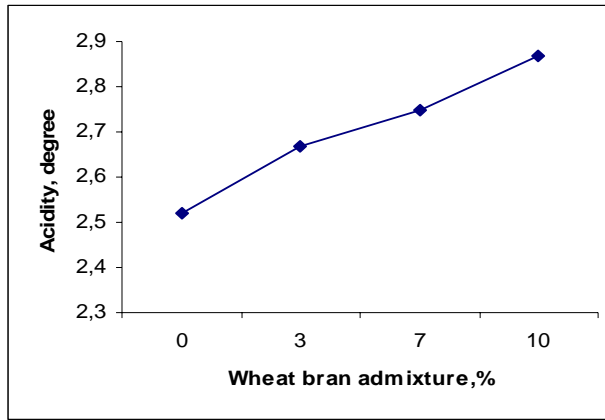


Figure 1. The influence of wheat bran admixture on bread acidity

From the figure 1 we can see that the quantity of wheat bran put in the samples grew while the acidity of the final product grows moderately. The acidity degree attains its maximum values, and these values ranging from 2.75 to 2.87, when the wheat bran admixture is 7% or over 7%.

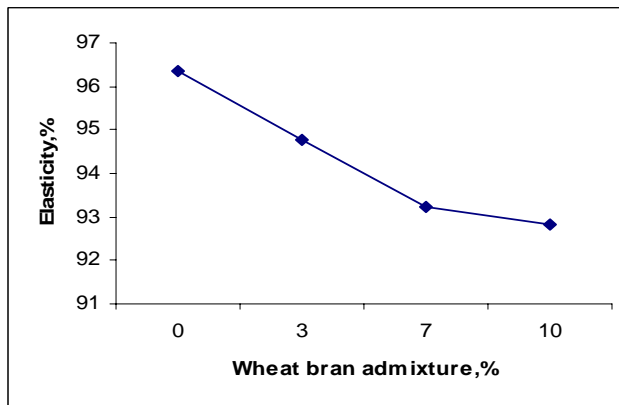


Figure 2. The influence of wheat bran admixture on bread elasticity

From the figure 2 we observe that the elasticity of bread decrease to wheat bran admixtures and over 7% of bran admixture remains practically constant.

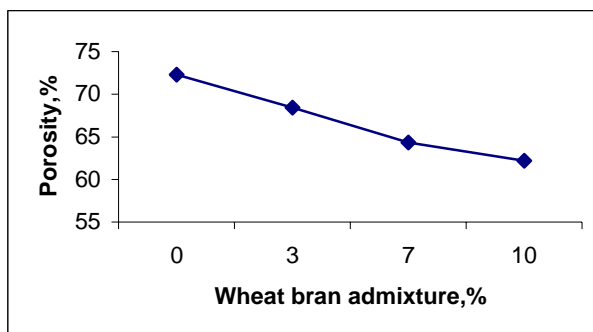


Figure 3. The influence of wheat bran admixture on porosity

From the figure 3 we observe that the porosity decrease about linearly as wheat bran is being added, they decrease as the percentage grows.

Thus when having more than 7% wheat bran added in the sample the product is round-shaped but is not symmetrical and as far as the volume is concerned, it is not sufficiently developed. The negative influence of barley quantities exceeding 7% is explained by the low gluten composition, whereas gluten is the basic element in the baking industry.

From these values, we could say that the best results we having for 7% wheat bran admixture.

Conclusions

The bran quantities added in the samples influence the physical parameters of the final product in a specific manner. The best results had been obtained when adding 7% wheat bran.

References

- Banu, C. (1998). *Manualul inginerului din industria alimentară*. București, Ed. Tehnică, Romania
- Leonte, M. (2000). *Biochimia și tehnologia panificației*. Ed. Crigarux, Piatra-Neamț, Romania
- Ciobanu, D. (2001). *Chimia produselor alimentare*. Ed. Info Chișinău
- Ciobanu, D. (2002). *Chimia produselor alimentare - investigații analitice*. Ed. Info

Researches Regarding the Fibers Influence on the Quality of Bakery Products

Chişinău

Leonte, M. (1998). *Tehnologii și utilaje în Industria Morăritului și Panificației – Tehnici de laborator*. Ed. Universitatea din Bacău, Bacău, Romania.

Leonte, M. (2001). *Tehnologii și utilaje în Industria Morăritului – Pregătirea cerealelor pentru măciniș*. Ed. Millenium, Piatra-Neamț, Romania

Leonte, M. (2003). *Tehnologii, utilaje rețete și controlul calității în industria de panificație, patiserie, cofetărie, biscuiți și paste făinoase. Materii prime și auxiliare*. Ed. Millenium, Piatra-Neamț,

Leonte, M. (2004). *Tehnologii, utilaje rețete și controlul calității în industria de panific România ație, patiserie, cofetărie, biscuiți și paste făinoase. Metode de preparare a aluatului*. Ed. Millenium, Piatra-Neamț, Romania

Leonte, M. (2005). *Tehnologii, utilaje, rețete și controlul calității în industria de panificație, patiserie, cofetărie, biscuiți și paste făinoase. Fermentarea și prelucrarea aluatului*. Ed. Millenium, Piatra-Neamț, Romania

Leonte, M. (2006a). *Tehnologii, utilaje, rețete și controlul calității în industria de panificație, patiserie, cofetărie, biscuiți și paste făinoase. Coacerea și uscarea aluatului*. Ed. Millenium, Piatra-Neamț, Romania

Leonte, M. (2006b). *Cerințe de igienă-HACCP și de calitate – ISO 9001:2000 în unitățile de industrie alimentară conform normelor Uniunii Europene*. Ed. Millenium, Piatra-Neamț, Romania