

THE IMPORTANCE OF UTILIZATION THE MALT MASH IN THE BAKERY

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Abstract

Using the new recipes and biotechnologies, using the flour as basic raw material, the bakers obtain a various range of products for the purpose of satisfying the larger and more diversified demands of the population. The reinforcing of the flour is wide spread practice, in the last period using on a large scale byproducts coming from different industries. The malt flour, obtained from the malt mas by specific procedures, byproduct resulted from the industry of beer, is the object of the present paper. Being introduced in the bakery products it fortifies the products due to its content in antioxidants, in phenolic compounds respectively, with an important role in prevention of some diseases. Its behavior in the bakery products is different depending the percentage used and the technology applied

Key words: beer, malt mash, malt flour, fermentation

INTRODUCTION

The bakery still remains an open subject to the researches because the science in the field of food industry evolves, being found new techniques of manufacture of bread, of its baking and also, the more and more utilization of different food fortifiers, being tested on the pilot level for the obtaining of innovating products designated for the human consumption with nutritional properties higher than of the classic products (Bei M, 2016).

The malt mash, the main waste resulted in the largest quantity in the beer factories, being obtained at the end of the phase of filtration of must in the department of boiling from the mash of saccharified barley, phase that has as purpose the separation of the particles in suspension and the sediments made in the mash-saccharification from the clear malt must. Practically this was used for decades as fodder for animals. Mussatto and the collaborators in 2005, following the accomplished studies, has concluded that annually are gathered quantities approximated to 85% from the total of waste generated by different industries.

Huige in the paper published in 1994 specifies that the chemical composition of the beer must is different depending on the diversity of barley used, on the process of malt manufacturing applied, the conditions of

obtaining the beer must and the type and quality of the auxiliary materials added, specifying that it is rich in fibers, proteins, minerals and antioxidants, compounds that are not used enough in the process of obtaining the beer, which correlated with the small price and the availability of supply represents real sources of nutrients and antioxidants.

Goupy and the collaborators in the paper published in 1999, specifies that approximately 80% from the phenolic compounds present in the beer come from malt and the rest comes from hop. These compounds represent a real source of natural antioxidants, capable to foreclose and treat different inflammatory affections, cardiovascular diseases, neurodegenerative diseases, even cancer, presenting an anti-tumor activity characterized by the inhibition of the proliferation of a variety of cancer cells (Domocoş D., 2018).

MATERIAL AND METHOD

The fresh malt mash obtained is difficult to be stored due to its high content of water, approximately 75%, the high potential of anti-oxidation and due to a strong enzymatic activity, thus, it is necessary its fast exploitation. In order to be introduced easily in the composition of pre-mixtures, the malt mash was dried in the oven for 6 hours, at the temperature of 78°C, until it has a content of 10% water, it was milled and then the 6 pre-mixtures from white flour and different percentages of malt flour were made (10%, 15%, 20%, 25%, 30%, 35%). The 6 versions of pre-mixtures were used for the obtaining of bread using traditional manufacturing recipes.

RESULTS AND DISCUSSIONS

The form of the products is similar, shaped, increased in the case of some experimental versions with small quantity of malt flour and less increased in case of the versions where it was used more malt flour. Also the volume of the products obtained was smaller for the bread obtained from premix with larger quantity of malt flour. This aspect can be explained by the retention of water by the fibers of malt flour, being known that it contains over 40% fibers compared to the wheat flour for example, which contains approximately 0,6%.

The aspect of the bread peel where it was introduced malt flour has presented the defect of cracking of the peel even from the phase of fermenting being maintained afterwards in the finished product. The larger the malt flour percentage in the composition of the pre-mixture the more pronounced was this defect. Also here it can be mentioned the fact that the color of the peel of the bakery products is different varying more between

the versions depending on the quantity of malt flour introduced in the pre-mixture, this being darker in color once the percentage of malt flour increases.

The aspect of the bread crumb presents a similar evolution depending on the type of pre-mixture from which the product was obtained. Thus, the breads with smaller content of malt flour are well baked, when beating the peel it produces a clear sound, elastic bread crumb, when it is pushed it comes back to the initial form, uniform, dry at touch while those with larger content present baked aspect, when beating the peel it produces a muffled sound, when it is pushed it comes slowly back to the initial form, when cut with the knife it is clean.

The porosity of the bread crumb from the versions where the malt flour percentage introduced in the pre-mixture was smaller, it presents a structure of the pores with oval form, well defined, uniform on the whole surface, compared to the samples where the quantity of malt flour introduced was greater, it presents a dense core, with acceptable porosity, small and dense pores. The rheological structure of the core is strongly affected by the introduction of the malt flour in a quantity greater than 20% of the total flours.

Regarding the taste of the products was observed it is present a mild or more intense smell of bran, depending on the percentage of malt flour introduced. The humidity considered in the 6 samples is different because the more the percentage of malt flour in the product the product retains more water. For this reason the superannuation of the product is accomplished in a shorter time, it is losing the specific taste, the smell becomes unpleasant after 24 hours at the room temperature.

CONCLUSIONS

The bakery products enriched with active biologic compounds, coming from the malt mash flour are designated to a wide category of consumers, healthy persons, preoccupied for the maintaining of the health condition and persons that suffer of mild impairment of the digestive tube, diabetics, hypertensive, overweight persons.

The functional bread obtained is a natural product, without preservatives, flavors or synthetic colorants. The bakery products present special sensorial qualities given by the pleasant aspect and specific flavor.

Due to the high content of fibers included in the malt mash flour, during the kneading it retains a greater quantity of water which makes the finished products to have a crispier peel by the evaporation of the water when it is baked.

We recommend the introducing of the dry malt mash in the peoples alimentation because by its composition it can have benefic effects on the

consumers like the following: it can prevent the increase of cholesterol favoring the elimination of the fat from the body, it can prevent the appearance of the coronary diseases, it can regulate and accelerate the intestine transit, it can prevent cancer, the gastro-intestinal diseases, the diabetes and the forming of gall bladder calculi.

REFERENCES

1. Anghel I. 1993. *Biologia și tehnologia drojdiilor vol II*, Editura TEHNICĂ, București;
2. Banu C., Ianitchi D. Vizireanu, C.Sahleanu E. 2011. *Living Food-Dead Food (Alimente vii-alimente nevii); Good Food –Bad Food (Alimente bune-alimente rele)*, Editura ASAB, București;
3. Banu C. 2010. *Aplicații ale aditivilor și ingredientelor în industria alimentară*, Editura ASAB, București;
4. Banu C. Stoica A. 2004. *Metode de analiză și control în industria panificației*, Editura Bibliotheca, Târgoviște;
5. Bei Mariana, Dalai Camelia, Domocoș Daniela, Dalai Ciprian. 2016. *Research on the content and necalorigeni nutrient high calorie in a standard vegetarian food*, Analele Universității din Oradea. Fascicula, Protecția Mediului Vol,bXXVI, anul 21., I.S.S.N. 1224-6255, pag. 223-230, (B+), Edit. Universității din Oradea
6. Domocos Daniela, Maghiar Marius Adrian, Anchidin Ovidiu, Bei Mariana, Ciavoi Gabriela. 2018. *Clinical and paraclinical researches on efficiency antioxidants in oral precancerous pathologies*. Analele Universității din Oradea. Fascicula, Protecția Mediului Vol, XXX, anul 23., I.S.S.N. 1224-6255, pag. 245-251, (B+), Edit. Universității din Oradea,
7. Mussatto S.I., Dragone G., Roberto I.C. 2006. *Brewers spent grain: generation, characteristics and potential applications*. J. Cereal Science, 43(1):1-14.
8. Goupy P., Hugues M., Boivin P, Amiot M.J. 1999. *Antioxidant composition and activity of barley (Hordeum vulgare) and malt extracts and isolated phenolic compounds*. J Agric Food Chem., 79:1625-34;
9. Huige N.J. 1994. *Brewery by products end effluents*, in: Hardwick, W.A. (Ed.), Handbook of Brewing. Marcel Dekker, New York, pp. 501-550;
10. Park H. 1997: *Fortifzing bread with each of three antioxidant*. Cereal Chem., 74,3, 202-206;
11. Jianu I. 1993. *Tehnologii generale în industria alimentara*, vol. I, Editura Euroart, Timisoara;