Preliminary Study of the Malt Extract Addition on the Wholemeal Bread Quality

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Abstract. Malt extract is used for improving the bread quality made from flour with low ability to form sugars. Introduced in dough it is useful for the yeast development, and multiplication and improve the gas fermentation yield. Therefore malt extract is considered a dough improver.

An important role is played by proteolytic enzymes of malt extracts. Present in large amounts proteolytic enzymes lead to worsening the bread quality and increase dough property to widen. Therefore for improving quality of malt extract, must take into account not only the chemical components but also the fermentation activity.

Dosing of malt extract is made depending on its fermentation activity and the properties flour, so the amount varies between 1 and 3% by weight flour. The purpose of this study was to emphasize the positive changes of the physical and chemical properties of wholemeal bread, by adding malt extract in different percentages (1% and 2%).

Keywords: functional products, wholemeal flour, malt extract, bread quality

Introduction Malt extract is used for improving the bread quality made from flour with low ability to form sugars. Introduced in dough it is useful for the yeast development, and multiplication and improve the gas fermentation yield. Therefore malt extract is considered a dough improver.

Other benefits of the malt extract addition are: a highest development of the crust and the improvement of the crust color, reducing the dough maturation period and decreasing the yeast amount; also, some beneficial changes of the dough rheological properties occur. (Pedersen & Eggum, 1983; Mencinicopschi et al, 1987; Nattress et al, 1987; Hansen et al, 1989; Pedersen et al, 1989).

During the malt extract production, the most valuable chemical compounds of the white active malt - enzymes, sugars and dextrins- are transferred almost completely in aqueous solution. The malt extract is a high density, viscous mass and contains all the soluble chemical compounds of the malt (Auerman L.I. 1960).

Due to its content in fermentable carbohydrates (approximately 50% w/w) and the enzymatic activity, especially α-amylase activity- malt extract improve the dough ability to produce gas.

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Dosing of malt extract is made depending on its fermentation activity and the properties flour, so the amount varies between 1 and 3% by weight flour.

Aims and objectives. The purpose of this study was to emphasize the positive changes of the physical and chemical properties of wholemeal bread, by adding malt extract in different percentages (1% and 2%).

Materials and methods. The recipe used for obtaining bread with malt extract, was the following one: flour 1000 g, water - 62%, yeast – 3%, salt – 1.5%, and malt extract...
addition in various amounts: 1% and 2%, respectively. Similarly, a control sample without malt extract addition was performed.

Malt extract was obtained following three stages of the technological process: grinding malt, knead-saccharification, filtration and concentration. Initially the malt wort had a concentration of 25.6° Bx. At the end of the malt wort concentration, performed in a Rotavapor Heidolph, under vacuum at a temperature of 70ºC, dry substance content reached 64.6° Bx.

After kneading the dough is maintained for 60 minutes at a temperature of 28 to 30 °C for bulk-fermentation, after which it is divided into two parts, with equal weight and is shaped in an oval shape. It is being put on trays and introduced in the fermentation room for 25 minutes at 35ºC and relative humidity of 75%. After fermentation, the products are baked at 220ºC for 30 minutes using a ZANOLLI type oven equipped with a proofer.

Also, the bread obtained after the above described method, was submitted to the physio-chemical exam, as following: crumb porosity and elasticity, moist, acidity and salt content (according to STAS 91-83 „Bread, loaf products and bakery specialties. Analysis methods”).

**Results and Discussion.** Malt extract comes with an intake of fermentable sugars, vitamins - nutrients necessary for yeast growth and for the production of fermentation gases, which improves the characteristics of the dough made from wholemeal flour.

The values of analyzed parameters for studied samples are presented in the next table:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Porosity, %</th>
<th>Elasticity, %</th>
<th>Humidity, %</th>
<th>Acidity, %</th>
<th>NaCl, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholemeal bread without the malt extract (control sample)</td>
<td>63</td>
<td>85.83</td>
<td>40.66</td>
<td>3.4</td>
<td>1.38</td>
</tr>
<tr>
<td>Wholemeal bread with 1% the malt extract</td>
<td>64</td>
<td>86.66</td>
<td>40.90</td>
<td>3.2</td>
<td>1.38</td>
</tr>
<tr>
<td>Wholemeal bread with 2% the malt extract</td>
<td>67</td>
<td>88.33</td>
<td>40.92</td>
<td>3</td>
<td>1.38</td>
</tr>
</tbody>
</table>

Both parameters porosity and elasticity, increased for bread with 2% malt extract comparing to the control sample: sample without the malt extract.

With increasing malt extract addition a noticeable decrease in acidity and a low variation of the core humidity was observed.

**Conclusion**

Analyzing the two experimental variants (the addition of 1% malt extract and 2% malt extract), both in terms of physico-chemical and sensorial, quality parameters were framed the limits specified by STAS.

A 2% malt extract may improve the wholemeal bread quality without the addition of other improvements.
REFERENCES


