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INFLUENCE OF SUBSTITUTION OF WATER WITH WORT ON QUALITY OF LIGHT RYE BREAD

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Abstract

Rye flour is mostly used in whole grain flour mixtures because it is rich in dietary fiber, minerals, proteins, and B-group vitamins. Hence, it is a poor source of sugars. Fermenting wort is aqueous malt extract which contains five sugars (glucose, fructose, sucrose, maltose and maltotriose). Its addition as an ingredient in light rye bread production could affect process control during fermentation. This, and other benefits of wort addition in light rye bread production have not been reported before. The aim of this research was to describe the impact of partial and complete water substitution with the wort on nutritional value, potential chemical contaminants, organoleptic properties, and technological aspects (fermentation and baking time) of light rye bread.

Five light rye bread samples were produced at industrial scale using the same production procedure, but with different ratios of water replacement with wort (0, 25, 50, 75 and 100%). Influence of substitution of water with wort to the nutritive value (analysis of fat, saturated fatty acids, protein, ash, water, sugar, salt, energy values, carbohydrates), to the concentration of contaminants (Pb, Cd, As) analyzed according to standard BAS EN ISO/IEC 17025, and organoleptic properties done by conventional sensory profiling of light rye bread are investigated in this study. Samples were fermented using brewing yeast *Saccharomyces cerevisiae*.

Sugar content was increased by wort addition from 3.78 and the maximum measured was 9.66 g/100 g. In the tested conditions of fermentation, baking temperature and baking time, the addition of 50% wort has a positive effect on the speed of dough fermentation, color, smell, taste, and consistency of the bread. Samples with added 50% and 75% wort have a positive effect on the nutritive value of the bread.

Based on the obtained results, it is suggested that the replacement of water with wort in light rye bread production is very important for obtaining the desired rye bread quality.

***Key words**: Fermentation, Nutritional value, Organoleptic properties, Rye bread, Wort.*