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BOOK OF ABSTRACTS

6TH MEETING
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Quantification of hydroxymethylfurfural and furfural in bread by high performance liquid chromatography

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Baking is a complex process that involves physical, chemical, and biochemical changes, which are essential for the development of the aroma, taste and color surface in the baked products. Colored compounds that result from Maillard reactions produced during the baking process are also related with nutritional aspects and formation of undesirable compounds. Hydroxymethylfuraldeyde (HMF) and furfural are furanic compounds generated during the advanced stages of Maillard reaction, commonly measured as quality parameters to evaluate the severity of the heat treatment. The objectives of this work were optimization and validation of an efficient extraction methodology for high performance liquid chromatography (HPLC) analyses of HMF and furfural in bread.

Extraction of HMF and furfural before quantification by HPLC was performed with oxalic acid and with water [1] followed by clarification with TCA [2], and extraction with water and clarification with Carrez I and II reagents [3]. Modifications of this last procedure were tried, namely, replacement of water extraction by different mixtures of water/methanol - 60/40; 70/30, 80/20 - followed by clarification with Carrez I and II reagents. The solvent mixture methanol:water (30:70) allows the highest yield.

The compounds under study were not detected in 100g of bread dough baked in microwave during 1 min and 30 sec, being an adequate matrix of baked dough free of HMF and furfural. Thus, it was used to study the matrix effect. Comparison was performed between the slopes of the regression lines obtained for pure standard calibration curve and for the sample curve calibration by least-squares analysis, and statistical differences were found ($p = 0.95$, $n = 12$ Student's t - test for paired samples), which points out the matrix effect and the choice of sample curve calibration for quantification of HMF and furfural in bread. Good quality parameters were obtained and the method was successfully applied to the analyses of different types of bread.

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