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BOOK OF ABSTRACTS

XII IBEROAMERICAN
CONGRESS OF FOOD ENGINEERING

CHALLENGING FOOD ENGINEERING AS A DRIVER TOWARDS SUSTAINABLE FOOD PROCESSING

UNIVERSITY OF ALGARVE, GAMBELAS CAMPUS
FARO / ALGARVE / PORTUGAL
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***“Challenging Food Engineering as a Driver
Towards Sustainable Food Processing”***

e-Book of Abstracts

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Food Processing Technologies

Food Physicochemical Properties (Rheology)

Poster Communications

Rheologic effect of selected acrylamide reducing agents from plant extracts in wheat and rye bread

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Bread is a staple food worldwide with an annual intake recommended by the WHO of 60kg / capita. Strategies to mitigate the occurrence of substances harmful to human health such as acrylamide (AA) should not interfere in food properties perceived by the consumers.

The objective of this work was to assess the rheologic (texture and color) effect on two types of bread formulas (wheat and rye) that the addition of acrylamide reducing agents from vegetable extracts (oregano, fennel, lemongrass, pear Rocha peel) may generate. Thirty-four batches of bread dough were prepared, with the extracts (liquid and dried). Each batch was composed of one control sample and five replicates added with extracts. Selected flour formulas were mixed followed by: controlled fermentation, division of units; cooking in traditional oven (TO) and convection oven (CO), 8 of wheat and 9 of rye for each oven. All variables were defined and controlled (fermentation and cooking time, cooking temperature, homogeneity of premixes). A Texture Profile Analysis (TPA) assay was performed. Six parameters of bread texture profile were determined: toughness; springiness; cohesiveness; gumminess; chewiness. Objective color measurement was calculated by the determination of colorimetric coordinates in the CIE L * a * b * color space. Through the chromatic coordinates a * and b *. The following reduction values were obtained: oregano in rye bread 17.7% (CO), in wheat bread 31.6% (TO) and 21.7% (CO); lemongrass in rye bread 27.5% (TO) and 7.8% (CO); fennel in wheat bread 33.5% (TO) and 41.5% (O2); peel of Rocha pear in rye bread 27.3% (CO), in wheat bread 19.2% (TO) and 12.5% (CO). Regarding to toughness, in wheat flour, the addition of the extracts of lemongrass (dry and aqueous) and fennel (dried) made the bread softer. In rye flour, the toughness was not influenced by the addition of extracts. There were changes in cohesiveness related to the type of oven. Extracts didn't influence elasticity of breads neither cause changes in the color. Crossing the acrylamide mitigation effects, and the rheological results will enable the election of the best baking process according to the varieties of bread.

Keywords: Wheat Bread, Rye bread, Rheology, Plant extract, Acrylamide