

ABSTRACT BOOK

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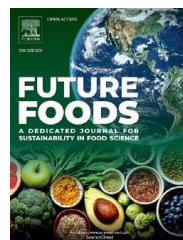
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Milling Techniques for Obtaining Whole-Wheat Biscuit Flours with Low Sanitary Risk

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Abstract:

This study evaluates the distribution of deoxynivalenol (DON) and asparagine (ASN), the main amino acid involved in acrylamide (AA) formation during baking, in wheat kernels. It aims to understand whether the milling processes influence sanitary risks of wholemeal flour also obtained by enriching refined flour with bran components, and their baked products. Two commercial lots of soft wheat underwent to roll and stone milling in a commercial mill plant and progressive debranning in a pilot scale plant. The obtained products were analysed for ASN and DON contents and flour obtained from their various combinations (final ash content of 1.6%) used for biscuits production. Biscuits were analysed for colour and AA content. Results show that ASN is mainly concentrated in wheat germ, then in bran fractions. In debranned fractions, there is a progressive decrease in ASN from the outer layers to endosperm. The 0-5% debranned fraction accumulates 35% of DON, while in biscuits the 5-10% and 10-15% wholemeal formulations reach the highest DON levels. Levels of AA are always higher in wholemeal recipes than refined standard, with a particularly high AA/ASN ratio in biscuits with stone milling wholemeal flour. Despite similar concentration of ASN and higher contamination by DON of coarse bran than fine bran, its ash content allows for a reduced amount in wholegrain formulation, limiting sanitary risks. This study points out how an appropriate selection of milling products in the formulation of whole-wheat flour could limit the overall sanitary risks in the production of bakery products.

Emulsion-Filled Gels Application in the Food Design of Baked Goods

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Abstract:

Emulsion-filled gels (EFG) are classified as soft solid materials and are complex colloids formed by matrices of polymeric gels into which emulsion droplets are incorporated. Several structural aspects of these gels have been studied in the past few years, including their applications in food. In our study EFG based on inulin, dry-fractionated proteins from legumes and sunflower oil were added in the formulation of a vegan brioche. The resulting experimental brioche were compared to a non-vegan control and their physical, chemical and sensory characteristics were analysed. The brioche prepared with EFG had harder texture compared to control, but the increasing of oil amount and the decreasing of water used in the EFG reduced the hardness of the product. No significant difference was found in the specific volume and springiness between the samples. The volatile profile of brioche mainly depended on compounds derived from the Maillard reaction, caramelisation and lipid oxidation or fermentation process. Furthermore, the results suggested that the concentration of certain compounds such as 2-pentylfuran, nonanal or benzaldehyde increased when EFG was added in the formulations. According to the sensory evaluation the brioche obtained with EFG at the highest percentage of sunflower oil was the most appreciated for crust colour, elasticity, typical odour of brioche and overall judgment. All the vegan brioche obtained could be labelled with "low fat" nutritional claim.