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Impact of Non-Starch Polysaccharides on Sensorial Characteristics and Textural Properties of Bread

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Abstract : Introduction: Cereals especially wheat is one example in this respite as it contains several nutrients and phytochemicals. In this regard, presences of non-starch polysaccharides are of significance value e.g. arabinoxylans (AX) and arabinogalactans (AG). These ingredients possess several functional and nutritional properties and in this project, efforts were directed to extract AX and AG from different spring wheat varieties of Pakistan and subsequent utilization in cereal based baked products. Methodology: In the present study, effort was made to characterize eight different spring wheats e.g. Lasani-08, FSD-08, Mairaj-08, Shafaq-06, Sehar-06, Bhakkar-02, Uqab-2000 and Inqalab-91 with special reference to non-starch polysaccharides (arabinoxylans and arabinogalactans) extraction followed by their utilization in baked products. Major Findings of Study: Results showed that the arabinoxylans and arabinogalactans content in whole wheat flour of different wheat varieties ranged from 2.93 to 4.68% and 0.47 to 0.93%, respectively while in bran, they ranged from 11.71 to 18.38% and 1.07-4.43%, respectively. Phenolic compounds i.e. ferulic acid, p-coumaric acids were 1.12 and 19.6mg/100g, respectively. Owing to presence of these phenolic compounds, it has persuasive antioxidant potential. Arabinoxylan has negative impact on gluten quality as reduced gluten strength was observed while significant results were obtained for rheological characteristic. Moreover, adding Arabinoxylan and arabinogalactan in bread formulation resulted in significant increase in volume and texture of the final product. In addition, the hardness of bread lessened considerably due to the increase in the concentration of arabinoxylan and arabinogalactan. Additionally, fracturability of bread improved as the both non-starch polysaccharides levels increased. The highest gumminess value was given to Shafaq-06 with increasing trend from control to 0.5% arabinoxylan. Whilst with the addition of arabinogalactan, the highest bread gumminess value (155.74 ± 6.1, 156.32 ± 7.9) was also observed in Shafaq-06. Concluding Statement: Conclusively, it may be inferred that non-starch polysaccharides hold potential to be extracted and utilized in cereal based products for best quality and value addition.

Keywords : non-starch polysaccharides, arabinoxylan, arabinogalactan, bread
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