Aurica CHIRSANOVA
Dr., assoc. prof., Technical University of Moldova
https://orcid.org/0000-0002-1172-9900
E-mail: aurica.chirsanova@toap.utm.md
Alina BOIŞTEAN
Dr., assoc. prof., Technical University of Moldova
https://orcid.org/0000-0002-5374-5853
E-mail: alina.boistean@toap.utm.md
Albina CIOCAN
PhD Student, Technical University of Moldova
https://orcid.org/0009-0002-3171-4201
E-mail: albina.ciocan@doctorat.utm.md

Evaluation of the effect of Jerusalem artichoke (*Helianthus tuberosus*) flour on bread quality parameters

Evaluarea efectului făinii de topinambur (Helianthus tuberosus) asupra parametrilor de calitate ai pâinii

Jerusalem artichoke (*Helianthus tuberosus*) is a nutrient-rich raw material, high in inulin, dietary fiber, essential amino acids, and minerals, making it a promising ingredient for functional food products. With growing interest in diversifying and improving bakery products, its flour can be used as a partial substitute for wheat flour. This study evaluated the effects of adding 2.5%, 5%, 7.5%, and 10% Jerusalem artichoke flour on the physicochemical, rheological, and sensory properties of wheat bread. The flour was obtained from Solar and Amicul II tubers through washing, slicing, convective drying, and milling. Analyses included flour composition, amino acid content (HPLC), dough acidity and volume during fermentation, and final bread quality. Results showed high dry matter and essential amino acid content, as well as valuable minerals. Adding the flour increased dough acidity and modified fermentation. Substitution up to 5% improved sensory properties while maintaining volume and crumb porosity, whereas 7.5–10% negatively affected gluten elasticity, crumb structure, volume, and crust color due to Maillard reactions. Sensory evaluation (30-point scale) rated 5% substitution as "very good," confirming it as optimal. Incorporating Jerusalem artichoke flour also enhanced nutritional value and could extend bread shelf life. In conclusion, a 5% substitution effectively produces a functional wheat bread with improved sensory and nutritional properties, highlighting the potential of Jerusalem artichoke as an innovative ingredient in the baking industry.

*** Acknowledgments:** The research was supported by Institutional Project, subprogram 020405 "Optimizing food processing technologies in the context of the circular bioeconomy and climate change", Bio-OpTehPAS, being implemented at the Technical University of Moldova.