

HABILITATION THESIS

Novel approaches in bread quality improvement and by-products valorization in the food industry

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ABSTRACT

Key words: *bakery, functional ingredients, sustainability, valorization, innovation*

The bakery industry is a fundamental sector of global nutrition, yet it faces significant challenges regarding product quality improvement and environmental impact reduction. This habilitation thesis addresses two essential directions for the development of the field: the integration of functional ingredients to optimize the nutritional and sensory characteristics of bread and the valorization of agro-industrial by-products to obtain value-added bakery products. The research aligns with current consumer trends that prioritize healthier, more sustainable, and innovative foods, while also contributing to advancements in food product engineering.

The first part of the thesis synthesizes the author's scientific, professional, and academic achievements, highlighting her progression from university training to the position of associate professor. It emphasizes her teaching activity, involvement in coordinating bachelor's and master's theses, contributions to the development of educational resources, and active participation in national and international research projects. The scientific impact of her work is reflected in a significant number of publications in prestigious journals and relevant scientometric indicators (WoS, Google Scholar, SCOPUS).

The second part of the thesis focuses on research activities, structured around three major directions: optimizing bread quality through the use of functional ingredients, valorizing by-products from the food industry to develop innovative and sustainable products, and assessing the impact of these approaches on the nutritional, technological, and sensory properties of the final products. The conducted studies provide concrete solutions for improving bakery product quality, contributing to the development of a sustainable model for resource utilization.

The impact of the research activity is confirmed by the publication of over 100 scientific articles and participation in international conferences. Additionally, collaborations with industry and academic institutions have enabled the practical application of research findings, demonstrating their relevance and industrial applicability.

For future development, proposed research directions aim to deepen studies on the valorization of agro-food by-products and the application of advanced technologies to enhance bakery product quality. Academically, strengthening interdisciplinary and international collaborations represents a strategic objective to increase the visibility and impact of the research.

In conclusion, the use of dietary fibers and functional ingredients significantly contributes to the creation of healthier and more innovative bakery products. At the same time, the valorization of by-products from the food industry offers sustainable solutions for waste reduction and the development of functional products with improved nutritional and technological benefits. Optimizing technological processes ensures the stability and acceptability of bakery products, facilitating the integration of these innovations into the industry and opening new research and application avenues.