Title: The Effect of Addition Fresh Lime on the Extrusion-Cooking Process and Selected Physical Properties of Snack Pellets

Presenting author name: Jakub Soja

Affiliation details of the Presenting author: University of Life Sciences in Lublin, Poland, Faculty of Production Engineering, Department of Food Process Engineering,

Co-authors' details: Maciej Combrzyński[1], Agnieszka Wójtowicz[1], Marcin Mitrus[1], Tomasz Oniszczuk[1], Kacper Gałan[1], Beata Biernacka[2]

Affiliation details of Co-authors:

[1] University of Life Sciences in Lublin, Poland, Faculty of Production Engineering, Department of Food Process Engineering,

[2] University of Life Sciences in Lublin, Poland, Faculty of Production Engineering, Department of Thermal Technology,

Abstract:

The modern market of snack products derived from plants is undergoing rapid expansion. A significant area of research is the identification of plant-based raw materials that can enhance the technological and functional properties of extruded products. The addition of fresh fruits is particular significance, as they have the capacity to influence the process and the quality of the final product. The aim of the present study was to evaluate the impact of incorporating fresh lime on the extrusion-cooking process and the selected physical properties of snack pellets.

The processed material was composed of blends derived from potato starch, with the incorporation of fresh lime in concentrations of 10%, 20%, and 30%, respectively. The composition of the recipe was supplemented by the addition of potato flakes, potato granules, salt, sugar, vegetable oil, and water. The extrusion-cooking process was conducted using an extruder-cooker equipped with a single-screw and a flat matrix (L/D = 20), under conditions of varying screw speeds and controlled thermal conditions.

The scope of the study encompassed the evaluation of the extrusion-cooking efficiency and energy consumption. In addition was conducted the analysis of the physical characteristics of the produced pellets. These characteristics included the bulk density of the pellets, the water

absorption index (WAI), and the water solubility index (WSI). The results of the study demonstrated that the incorporation of fresh lime in the raw material blend had a significant impact on extrusion-cooking process and the physical characteristics of the final product. Changes in the composition of the formulation have implications for the structure of the pellets and functional properties. This is important in later stages of processing and during the preparation of the product for consumption.

The findings of the study indicate the potential of fresh lime as a natural modifier of the properties of snack pellets. The results obtained constitute a valuable source of information for the development of innovative products that align with current market trends.

Biography

Jakub Soja is research and teaching staff member and my work focuses on pressure-thermal processing, particularly the extrusion of food and biopolymer materials. His research includes the use of by-products from the agri-food industry and the development of sustainable technologies in line with the principles of the circular economy. Jakub Soja has experience in research design, data analysis and the interpretation of results in the field of plant-based and biodegradable materials. He is author and co-author of over 20 scientific publications and combine my research activities with teaching.