Study on the valorization of Gac (*Momordica cochinchinesis* Spreng) by-product by extrusion technology

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Abstract

Extrusion is one of the most versatile and commercially successful processing technologies, with its widespread applications in the production of pasta, snacks, breakfast cereals, and meat analogues. The addition of functional nutrients or foods high in bioactive substances can improve the functional qualities of extruded food items. Gac (*Momordica cochinchinensis* Spreng), a tropical fruit, has been used as a food colorant and traditional remedy in the East, and Southeast Asia and is commonly used to make the Gac oil in the food industry. During oil extraction processing of Gac fruit only edible aril is the most valuable component used whereas the pulp, peel, seeds, and pomace become the by-product which still has a lot of bioactive compounds such as carotenoids, particularly β-carotene, lycopene, lutein, α-tocopherol, essential fatty acids, total phenolic, and flavonoids content. There is no study on the application of Gac by-products as a highly efficient technology extrusion. The study of puffed snacks enriched with Gac pomace powder at ratios of 5, 10, 15, 20, and 25 % (w/w) can be done by applying highly efficient extrusion technology at variable extrusion parameters such as temperature (100℃, 110℃, 120℃) and screw speed (320, 350 and 380 rpm). The effect of Gac pomace powder and extrusion parameters on the physicochemical properties, the stability of bioactive compounds, and *in vitro* digestibility of puffed snacks will be analyzed via numerous instrumental measurements. The expected result is that the addition of Gac pomace powder would improve the nutritional properties with more bioactive compounds and the good sensory quality of the final product.

Keywords: Gac pomace powder, extrusion technology, puffed snack, sustainability, circular economy

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