Development of a Bakery Product for Celiacs: A Novel Approach for Fiber Enrichment Using Agroindustrial Residues

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Celiac disease is an autoimmune disorder that is triggered by the ingestion of gluten, a protein present in wheat, rye, oat, barley and its derivatives. If not correctly treated, the disease could lead to other problems, such as infertility, osteoporosis and other diseases in the skin, liver, joints, uterus, brain and heart. In some severe cases, it could also lead to intestinal cancer and even death. The treatment of this disease is a gluten-free diet. Due to the restrictions that their diet implies, celiacs have a low intake of nutrients, especially fibers. In the north coast region of Rio Grande do Sul there is a huge production of fruits and cereals. This way, the agro-industry itself demands solutions for reusing the residues that it generates, both to reduce economic losses and to minimize environmental impacts. The aim of this study was to propose the development of a bakery product with higher levels of dietary fibers and pleasant palatability for the carriers of the celiac disease using agroindustrial residues of my region as raw materials. I tested various raw materials and identified that green banana flour (GBF), tapioca flour (TF) and pineapple peel flour (PPF) were better accepted by sensory assessors. This way, I used a 2^3 factorial design with response surface methodology in order to evaluate the variables GBF, TF and PPF in the development of the products. Sensory assessors evaluated these products with the 9-point hedonic scale with reference method. Analysis of Variance was used to analyze the significance of the proposed model at 95% of reliability. Results pointed that the most accepted product contained 8,6% of fiber, also being 170% cheaper than the similar product with the lowest price available in the Brazilian market.

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