

**DEVELOPMENT OF NUTRITIOUS COOKIE USING PAPAYA
(*Carica papaya*) FLOUR, PUMPKIN SEED (*Cucurbita maxima*)
FLOUR AND RICE FLOUR INCORPORATED WITH WHEAT
FLOUR**



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ABSTRACT

This study developed and evaluated nutritious cookies based on papaya flour, pumpkin seed flour, and rice flour combined with wheat flour, aiming to reduce agro-industrial waste and provide healthier snack options. This research performed to fill in part of the gap, that is to meet the need for healthy snacks and reduce agro-industrial waste specifically post-harvest losses of papaya and underutilized pumpkin seeds. In five different cookie formulations, the usual wheat was partially replaced by these alternative flours (papaya flour, pumpkin seed flour, and rice flour) and, Cookies weight, diameter, thickness, volume, hardness, and spread ratio were obtained. Also, proximate composition was checked (moisture, ash, fat, fiber, protein, carbohydrate, and total energy) and sensory attributes such as appearance, aroma, flavor, texture, and overall acceptability were also tested. In addition, the microbial activity across 30 days of storage period was tested for all the samples. Overall, the results showed that mixing in alternative flours influenced the cookies' nutritional and physical properties. The selected treatment sample demonstrated high moisture ($5.68\pm 0.04\%$), increased protein content ($9.88\pm 0.62\%$), ash content ($3.79\pm 0.16\%$), and fiber ($4.34\pm 0.42\%$), while diminished carbohydrates and fat ($62.85\pm 2.01\%$, $15.19\pm 0.85\%$ respectively) compared to the control sample. Sensory evaluation showed that the cookies with a well-blended mix of alternative flours (T3) earned high scores for appearance, taste and overall acceptability. All in all, it seems that the use of papaya, pumpkin seed, and rice flour can boost a cookie's nutritional profile without losing that familiar, tasty feel. The results point out the source of these flours for developing healthier bakery products, agriculture sustainability, and addressing public health issues concerning malnutrition and NCDs. Optimization of storage conditions with different packaging materials and extended shelf life is suggested for further study.

Keywords – Alternative flour, Microbial activity, Non-communicable diseases, Sensory attribute

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