

DEVELOPMENT OF COOKIES INCORPORATED WITH RIPE BANANA PEEL FLOUR (*MUSA SPP.*) AND UNRIPE BANANA FLOUR



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ABSTRACT

This research focused on developing nutritionally improved cookies by partially replacing wheat flour with ripe banana peel flour (RBPF) and unripe banana flour (UBF). Five treatments were formulated using the ratios. They were, T1 (100% wheat flour), T2 (5% RBPF + 10% UBF), T3 (5% RBPF + 15% UBF), T4 (5% RBPF + 20% UBF), and T5 (5% RBPF + 30% UBF). All samples were evaluated for physicochemical, functional, microbial, and sensory qualities. The results showed that increasing the substitution level of RBPF and UBF significantly enhanced ash, moisture, fiber, and bulk density, while fat and carbohydrate contents gradually decreased compared to the control. These improvements were attributed to the high dietary fiber and mineral content of banana peel flour and the resistant starch present in unripe banana flour. Although T5 had the highest nutritional improvement, it exhibited a darker color, stronger banana taste, and firmer texture, which reduced sensory acceptance. Sensory evaluation identified T3 (5% BPF + 15% UBF + 80% wheat flour) as the best overall treatment, providing a favorable balance of taste, aroma, texture, color, and appearance. The moderate incorporation of banana-based flours in T3 improved crispness and flavor without compromising cookie quality. Microbial results confirmed that all samples remained within safe consumption limits during storage. This study demonstrates the potential of ripe banana peel flour and unripe banana flour as sustainable, nutritive ingredients in cookie production, enhancing nutritional value while reducing banana waste.

Keywords: Banana peel flour, Cookies, Nutritional improvement, Sensory quality, Unripe banana flour.

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