

## Production and Quality Assessment of Antioxidant-Rich Biscuit Produced from Pearl Millet and Orange Peel Flour Blends

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**Abstract :** The unstable free radicals molecules oxidize cells throughout the body to cause oxidative stress, which has been implicated in the pathogenesis of many chronic diseases. Thus, the consumption of antioxidant-rich snacks could help to reduce the production of these free radicals in the body. This study aimed at producing antioxidant-rich biscuits from an underutilized pearl millet and agricultural waste from orange peel flour (PMF and OPF, respectively) blends. Biscuits were produced from PMF, and OPF blends using various proportions (95:05; 90:10; 85:15; 80:20 with 100% PMF as control. The functional properties of the flours, as well as the antioxidant properties, physical evaluation, and consumer acceptability of the biscuits, were evaluated. The functional properties of the composite flour showed an increase in oil absorption capacity (7.73-8.80 g/ml), water absorption capacity (6.82-7.21 g/ml), foaming (3.91-5.88 g/ml), and emulsification (52.85-58.82 g/ml) properties. The increased addition of OPF significantly ( $p < 0.05$ ) increased the antioxidant properties of the biscuits produced from the composite flour. For instance, the ferric reducing properties (0.10-0.4 mgAAE/g), total flavonoid (1.20-8.12 mg QE/g), and ABTS radical scavenging (1.17-2.19 mmol/TEAC/g) of the composite flours were increasingly comparable to those of 100% PMF. The physical parameters of the biscuit were significantly different ( $p < 0.05$ ) from one another. The addition of OPF into PMF reduced the weight, diameter, and spread ratio of biscuits produced while contrarily increasing the height of the biscuit. The incorporation of OPF at 5% (95:05) substitution yielded a consumedly acceptable biscuit product. The significant increase in antioxidant properties with an increase in OPF during the production of biscuits would therefore increase the nutritional value and potential health benefits.

**Keywords :** orange peel, biscuit, antioxidant, pearl millet

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