



## EFFECT OF SUBSTITUTION OF WHEAT FLOUR WITH ARROWROOT FLOUR ON THE CHARACTERISTICS OF MUFFINS

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### Abstract

Arrowroot (*Maranta arundinacea*) is an underutilized gluten-free tuber crop available in Sri Lanka with a rich nutritional and therapeutic profile. The purpose of this study was to develop muffins supplemented with Arrowroot flour and to evaluate its nutritional and sensory qualities. Fresh tubers of Arrowroot were cleaned, peeled and cut into thin slices. The slices were dried and ground into flour, sieved through a 60 mesh screen and stored in air-tight glass container. Five types of muffins were prepared using different composite blends of wheat and Arrowroot flour which were mixed in the ratios of 100:0 (control), 80:20, 70:30, 60:40, and 50:50. The sensory profile and nutritional profile of the developed muffins were analyzed and microbial studies were conducted over four weeks at ambient temperature storage (25 °C). The results revealed that the ash content of the muffins increased from 1.18±0.05% to 1.72±0.03% with the addition of Arrowroot flour from 0 to 50%. However, protein content (7.95±0.10% to 6.55±0.01%), total fat content (12.61±0.06% to 10.05±0.05%), carbohydrate content (68.41±0.01% to 64.45±0.01%) and energy value (418.89±1.37 to 374.46±0.51 kcal 100 g<sup>-1</sup>) showed a gradual decline along with the addition of Arrowroot flour. The sensory evaluation revealed that there were significant differences among the muffins in terms of appearance, colour, texture, taste, aroma, and overall acceptability. Furthermore, the sum of ranks for overall acceptability of muffins with 80:20, 70:30 substitution was higher than the sum of ranks for overall acceptability of the control sample. According to the microbial test results, aerobic plate counts and yeast and mold count increased drastically while coliforms and *Escherichia coli* were not detected during the experimental time period. Therefore, 30% (w/w) substituted muffin was found to be microbiologically safe for a minimum of 7 days at ambient temperature storage.

**Keywords:** Arrowroot, Muffin, Nutritional profile, Sensory profile, Microbial studies