

Effect of Replacement of Wheat Flour with Sweet Potato Flour on Quality Characteristics of Muffins

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Abstract

Sweet potato mixed wheat composite flour could make a protein rich product with good baking qualities, which would increase the economic value. Therefore, a research was carried out to develop a low gluten muffin, supplemented with sweet potato flour and to assess its nutritional and sensory qualities. The fresh roots of sweet potato (var. *Wariyapola Red*) were peeled, washed and cut into thin slices. The slices were washed and dried in the dehumidifier drier at 60°C for 12 hrs. The chips were ground into flour using an electric grinder, sieved through 710 nm sieve and packed in air tight glass containers. The sweet potato flour was added in different amounts as an ingredient during the preparation of muffins. Different composite blends of wheat flour and sweet potato flour were mixed in the ratios of 100:00, 80:20, 70:30, 60:40, and 50:50. The muffins were analyzed for nutritional qualities such as moisture, ash, protein, fat, fiber, vitamin A, calcium, iron, phosphorus and antioxidants, physical properties of weight and volume and sensory attributes like colour, texture, taste, flavour and overall acceptability. The nutritional analysis revealed that the moisture, ash, fiber, vitamin A and calcium content were increased from 8.73 to 11.95%, 1.14 to 2.57%, 6.51 to 12.16% 11.15 to 358.5 µg/100g and 24 to 29.5 mg/100g, while fat, protein, iron, and phosphorus content decreased from 2.89 to 1.68%, 8.74 to 7.63%, 3.18 to 1.98 mg/100g and 278.9 to 167.5 mg/100g, respectively with the increasing of the sweet potato flour from 0 to 50%. However, the total antioxidant activity is increased from 542.2 to 786.4 mg AA/100g with the increasing of the sweet potato flour from 0 to 50%. Volume of the muffins decreased from 105.25 cm³ to 91.85 cm³ mean while weight of the muffin increased from 87.1 g to 96.4 g with increasing of sweet potato flour substitution. The sensory assessment showed that there were significant differences (p<0.05) among the treatments in terms of colour, texture, taste, aroma and overall acceptability. The mean sensory scores showed that consumers preferred the muffins made from 100% wheat flour however, muffins from the composite flours of 30% sweet potato flour substitution was also well accepted by the panelists. The muffins made from 30% sweet potato flour and 70% wheat flour had the comparable nutritional, physical and sensory attributes to the 100% wheat flour muffins. The outcome of the present study could be used as valuable information for the development of high fiber-low gluten muffins which is beneficial for human health with low cost of production.

Keywords: Composite flour, Low gluten, Muffins, Nutritional quality, Sweet potato flour

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