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Using Cassava (*Manihot esculenta* Crantz) Flour as a Composite Blend for Muffins: Quality and Sensory Characteristics

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Abstract

Cassava as a root crop has a short storage life is a good source of energy but is low in protein. In the midst of high wheat grain prices, the use of cassava flour for bakery products is being promoted, though the very low protein content of cassava is of some concern. As a means of increasing the protein content of cassava flour, the addition of soy flour to form the composite flour was employed. This study evaluated the quality characteristics of muffins baked from high quality wheat/cassava/soy composite flours. The M Mex 59 cassava tubers were processed into flour. Three composite flour blends were prepared with 40%, 50% and 60% cassava flour with 10% soy flour. Physico-chemical analysis and sensory evaluation by focus group and hedonic scoring were conducted on muffins from each of the composite flour blends and 100% wheat flour as the control muffin.

The protein content, moisture content, ash content, texture, muffin height and colour of the muffins were measured. A focus group evaluated the sensory difference of the muffins and sensory acceptability was determined using untrained participants (n=51). Results showed that the protein content of the composite flour was significantly affected by the addition of cassava flour and soy flour. Muffin colour progressively darkened as cassava flour level increased. Changes in the muffin height were not significantly different ($P>0.05$). Increasing cassava flour levels resulted in a reduction of the hardness (mm/3 sec) of the muffins from 9.00 to 14.57 with substitution of 50% of cassava flour.

From the focus group evaluation, the muffins from composite blend 50% wheat/40% cassava/ 10% soy were most preferred and were significantly different for taste ($P<0.01$) and after-taste($P<0.05$). Appearance, texture, volume and overall appearance scores of the 50%wheat/40%cassava/10%soy muffins did not differ significantly on comparison to 100% wheat flour. The addition of cassava flour and soy flour positively affected the quality characteristics of the composite flour muffins.

Key words: wheat/cassava/soy composite flour, muffins, hedonic scoring, physico-chemical analysis