

Effects of incorporation of orange-fleshed sweet potato flour on physicochemical, nutritional, functional, microbial, and sensory characteristics of gluten-free cookies

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Abstract

Cookies were formulated with orange-fleshed sweet potato (OFSP) flour, amaranth flour (AF), and cassava starch powder (CSP) in the ratio of 0:50:50 (control), 40:30:30 (T₁), 50:25:25 (T₂), 60:20:20 (T₃), 70:15:15 (T₄), 80:10:10 (T₅), 90:05:05 (T₆), and 100:0:0 (T₇), respectively. The cookies were prepared and evaluated for physicochemical, nutritional, and sensory characteristics. Significant decrease in water absorption, oil absorption, increase in spread ratio, spread factor, and hardness of gluten-free (GF) cookies with an increase in the incorporation of OFSP flour. The dough stability, consistency, and farinograph quality number were increase. The OFSP cookies were superior to control for bioactive components and antioxidant activity. The cookies containing 70% OFSP flour with 15% AF and CSP found organoleptically acceptable and safe for 90 days of storage period.

Practical applications

The orange-fleshed sweet potato tubers are rich in health benefit components such as β -carotene, phenolic acids, carbohydrates, fibers, thiamine, riboflavin, niacin, potassium, zinc, calcium, iron, and vitamins A content. The potential of orange-fleshed sweet potato flour was utilized for the development of gluten-free (GF) cookies enriched in carotenoids content. The in-depth study of various functional, nutritional, and rheological properties of orange-fleshed sweet potato flour with amaranth flour and cassava starch powder represents its suitability for the preparation of functional GF cookies enriched in micronutrients. The additional benefits of combinations of these ingredients in GF cookies can be used for celiac patients, fasting purpose, and to combat the deficiency of vitamin A.

CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

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