DEVELOPMENT AND QUALITY EVALUATION OF BISCUITS USING WHEAT FLOUR AND SWEET POTATO FLOUR

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ABSTRACT

Biscuits are popular bakery products enjoyed for their good taste, low cost, and long shelf life. Most biscuits are made using refined wheat flour, which gives a good structure but provides limited nutrition. This study was carried out to improve the nutritional value of biscuits by replacing part of the wheat flour with sweet potato flour. Five mixing ratios were used: 100:0 (T_0), 90:10 (T_1), 80:20 (T_2), 70:30 (T_3), and 60:40 (T_4). All biscuits were prepared under the same conditions and tested for their physical qualities, chemical composition, and microbial safety to identify the best formulation. Physical results showed noticeable changes when sweet potato flour was added. The control sample T_0 had a diameter of 3.39 cm, a thickness of 0.77 cm, and a spread ratio of 4.76. The T_4 sample, which contained the highest sweet potato level, showed better spread ratio during baking with a diameter of 3.90 cm, a thickness of 0.55 cm, and a spread ratio of 7.84. Biscuit weight also reduced from 5.61 g in T_0 to 4.86 g in T_4, indicating improved dough expansion. Chemical results also changed with sweet potato flour. Moisture increased from 3.68% in T_0 to 4.45% in T_4. Ash increased from 1.29% to 1.50%, and fiber increased from 0.46% to 0.66%. Protein slightly decreased from 4.05% in T_0 to 3.95% in T_4, and fat decreased from 25.45% to 20.21%. Other nutritional values such as total sugar, reducing sugar, antioxidant activity, pH, and total soluble solids also shifted in a positive direction, showing that T_4 had an overall better nutritional profile. Microbial testing conducted after one week showed that both T_0 and T_4 were safe for consumption. The control sample (T_0) recorded 0.72 CFU/g, while the best sample (T_4) recorded a slightly lower value of 0.64 CFU/g. This shows that adding sweet potato flour did not increase microbial growth and remained within safe limits. Therefore, the study showed that replacing wheat flour with sweet potato flour improved the nutritional and physical qualities of the biscuits while keeping them microbiologically safe. Among all treatments, T_4 (60% wheat flour and 40% sweet potato flour) was identified as the best formulation because it offered better nutrients, improved physical properties, and a lower microbial count than the control.

Keywords: Composite flour, Nutritional quality, Sweet potato flour, Sensory evaluation, Sustainable bakery development, Wheat flour.

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