Development of Cost Effective Vegetable Biscuit with Locally Available Materials and Evaluation of Its Physico-Chemical, Microbiological and Sensory Properties

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Abstract

Vegetables play an important role in human nutrition, being mostly low in fat and carbohydrates, but high in vitamins, minerals and dietary fiber. Biscuit is most popular flour based baked food product in all over the world. The proposed study aimed to investigate the utilization of locally available nutritious vegetables to develop cost effective wheat flour based vegetable biscuit and to evaluate its physio-chemical, microbiological and sensory properties. Wheat flour, margarine, sugar, eggs, salt, baking powder and vegetables including carrot (*Daucus carota*), cowpea (*Vigna unguiculata*) and moringa leaves (*Moringa oleifera*) were used as ingredients for biscuit production. Accordingly, the dehydrated each of vegetable powder were incorporated together as carrot (65%), cowpea (25%) and moringa leaves (10%) to prepare mixed vegetable powder and biscuits were then prepared with mixed vegetable powder which was substituted for 0%, 5%, 10%, 15%, 20% and 25% of wheat flour. The best consumer preferred sample was selected using a semi trained panel consisted of 30 members and the selected biscuit was further examined for its nutritional and microbiological qualities. The data obtained from the experiment were analyzed using Minitab computer software (version 17.1). The results of the sensory evaluation were shown that the average scores for all the sensory attributes were higher in 10% substitution than those of biscuits substituted with different levels of mixed vegetable powder. The results of nutritional analysis showed that the moisture, total ash, crude fat, crude fiber, protein and carbohydrates content of the selected vegetable biscuit were 4.31±0.37%, 3.0±0.16%, 15.84±0.16%, 5.12±0.12%, 9.63±0.1% and 61.90±0.8%, respectively. The average vegetable biscuit diameter, thickness and spread ratio were 54 mm, 4 mm and 13.5, respectively. The results of total plate count (TPC) and yeast and mould count for the selected best biscuit product after two months of period were found to be 1.02×10^{-4} CFU/g and 0.6×10^{-4} CFU/g, respectively without addition of any artificial preservatives and it was found to be within the acceptable standard levels. Eventually, it can be concluded that the dehydrated mixed vegetable powder can be effectively used to produce biscuits in order to increase nutritional improvement of flour based biscuits.

Keywords: Carrot, Cowpea, Drumstick, Value-addition, Vegetable biscuits

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