

**NUTRITIONAL AND SENSORY QUALITIES OF PROTEIN AND
IRON ENRICHED PORRIDGE FORMULATED FROM MAIZE
GERMINATED GREEN GRAM AND MORINGA LEAVES**

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BY

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ABSTRACT

Malnutrition, with its two constituents of protein–energy malnutrition and micronutrient deficiencies, continues to be a major health burden in developing countries. Considerable efforts are needed to improve the health and nutritional status of the population by the development of nutritious foods with locally available materials. Therefore, a study was conducted to enhance the nutritional qualities of protein and iron of widely used traditional food maize porridge by incorporating germinated green gram and moringa leaves.

Germinated green gram flour, in the amounts of 10, 20, 30 and 40 g and moringa leaves pieces as constant amount of 10 g were incorporated with maize flour for the formulation of 100 g of porridge mixture. The mixtures were subjected to nutritional and organoleptic analysis to evaluate the suitability of this porridge mixture for consumption and for long shelf life. The nutritional (moisture, ash, protein, fat, fiber, total sugar and iron) qualities, organoleptic (colour, texture, taste, aroma and overall acceptability) characteristics and total plate count were analyzed after formulation and during storage. The nutritional analysis of the developed products revealed that protein, ash, fiber and iron were increased from 10.43 to 20.71%, 1.29 to 2.56%, 1.87 to 3.08% and 0.94 to 4.92 mg% respectively while moisture content, fat and total sugar decreased from 3.51 to 3.03%, 3.05 to 2.38% and 4.21 to 1.32% respectively with the increase in germinated green gram flour from 10 to 40% in the formulated porridge mixtures. Seven point hedonic scale was used to evaluate the organoleptic characters. According to Tukey's test, the mean scores for all the assessed sensory characters varied significantly ($p < 0.05$) in the freshly made porridge mixtures. No harmful total plate count was observed in freshly made porridge mixtures.

Based on the quality characteristics, most preferred protein and iron enriched porridge mixtures were selected and subjected to storage studies in ambient condition of 30°C and 70 – 75% RH. Quality assessments of porridge mixtures were carried out in two weeks interval throughout the storage period. The results of storage studies revealed that, the declining trends in protein, fat, fiber, ash, total sugar and iron and an increasing trend in moisture content of the porridge mixtures. The results of nutritional analysis showed that, there were significance differences ($p < 0.05$) between the tested treatments. From the overall acceptability rating, the porridge mixture with 70% maize flour, 20% germinated green gram flour and 10% moringa leaves had the highest mean value compared with other treatments. There is no remarkable changes in organoleptic characters were observed up to 20 weeks of storage in 30 °C and RH of 80% indicating that the porridge mixture containing 70% maize flour, 20% germinated green gram flour and 10% moringa leaves had the extended shelf life.

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