



The Effect of Moringa *Oleifera* Leaf Powder on the Nutritional Composition and Consumer Acceptability of White and Brown Bread Types

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Abstract

Fortification of popular staple foods such as bread with leaf powder of the locally available and accessible *Moringa oleifera* could be used to address undernutrition in the vulnerable population groups. This study aimed to determine the effect of *Moringa oleifera* leaf powder (MOLP) on white and brown bread. White and brown bread samples were prepared by partially replacing white bread and brown bread flour, respectively, with 5% and 10% substitution levels (w/w). Standard white and brown bread types served as corresponding controls (0% MOLP) for the white and brown bread samples, respectively. The nutritional composition of the bread samples and the controls was analysed using standard methods. Fifty-four University students and staff members evaluated the acceptability of the bread samples using a nine-point hedonic scale.

Bread samples became darker as the concentration of MOLP was increased, whilst nutrient levels increased. Protein concentration increased significantly when MOLP was increased to 5% and 10% in white bread and brown bread, respectively ($p < 0.05$). On the other hand, iron concentration increased significantly when MOLP was increased to 5% and 10% in brown bread and white bread, respectively ($p < 0.05$). The overall consumer acceptability of the two bread types decreased with increasing concentration of MOLP. However, brown bread samples were significantly more acceptable compared with corresponding white bread samples. At the 5% MOLP substitution level, the brown bread sample was as acceptable as the control ($p < 0.05$). MOLP had a less negative effect on the consumer acceptability of brown bread than on white bread probably due to the fact that consumers expect brown bread to be dark in colour, whereas they expect white bread to be light. For consumers who prefer white bread to brown bread, the highly perceived change in the colour of white bread, from light to dark, caused by incorporation of MOLP could be attenuated by adding a lightening agent together with MOLP in the white bread formulation.

Under the current experiment conditions, it seems that brown bread containing 5% MOLP can be used to contribute significantly to addressing malnutrition, with respect to protein and iron deficiencies in vulnerable population groups.

Biography: Laurencia Govender

Laurencia Govender is a registered dietitian, who obtained her BSc Dietetics, PgDip Dietetics, MSc Dietetics (summa cum laude) and PhD Dietetics at the University of KwaZulu-Natal (UKZN). She is a Nutrition Lecturer in the Discipline of Dietetics and Human Nutrition at UKZN. Prior to taking up employment at UKZN, she had been working for the Department of Health as a Clinical Dietitian at Edendale Hospital and was an accredited training dietitian for the fourth year UKZN dietetic students for six years. Her research focuses on food-based nutrition interventions to reduce both over- and undernutrition particularly in rural population groups of KwaZulu-Natal province, South Africa. She has a passion for both community and clinical nutrition.