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Effect of nixtamalisation on the nutritional, anti-nutritional, functional, physicochemical, and mineral properties of maize(*zea mays*) tortillas

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Abstract

The use of maize (*Zea mays*) in the developing world necessitates research into innovative processing techniques to streamline manufacturing and familiarize consumers with a wide range of food products based on maize. This study aimed to evaluate the effect of nixtamalisation on nutritional composition, reduction of anti-nutritional factors, functional performance, physicochemical characteristics, and mineral bioavailability of maize tortillas to better understand the nixtamalisation settings. The nutritional contents and their availability may be impacted by the compositional characteristics of maize and local processing methods; for instance, during traditional food preparations, the pericarp is sieved out as unwanted material, which causes the loss of many nutrients present in the maize kernel structures. Such processing limitations highlight the need for refining indigenous techniques to retain or enhance nutrient density. Nixtamalisation is a common method that improves the nutritional content of maize-based products and helps to create certain food varieties. It also significantly influences texture, flavor, and mineral availability, contributing to overall product quality. In conclusion, the physicochemical, functional, mineral, and sensory qualities of Nixtamalized Quality Protein Maize (QPM) tortillas enhanced with soybean flour were substantially enhanced by the cooking duration, steeping time, and lime concentration, enabling their acceptance by the consumer panelists. These findings underscore the importance of optimising traditional maize processing techniques such as nixtamalisation to produce nutritionally superior, culturally relevant, and sensory-acceptable products. This study contributes valuable insights for developing improved maize-based foods that may support sustainable nutrition and long-term food security in resource-limited, rural, and economically disadvantaged regions, particularly among vulnerable, underserved, and malnourished populations.

Keywords: Functional, nixtamalisation, physicochemical, sensory properties

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