



Editor:
Wasu Pathom-aree,
Chiang Mai University, Thailand

Article history:
Received: May 12, 2020;
Revised: July 1, 2020;
Accepted: October 12, 2020;
<https://doi.org/10.12982/CMUJNS.2021.035>

Corresponding author:
Dianne Jane A. Sunico,
E-mail: dasunico@up.edu.ph

Research article

Physicochemical and Nutritional Properties of Nixtamalized Quality Protein Maize Flour and its Potential as Substitute in Philippine Salt Bread

Dianne Jane A. Sunico^{1,*}, Felicitto M. Rodriguez¹, Arvin Paul P. Tũaño^{1,2}, Lotis E. Mopera³, Liezl M. Atienza¹, and Clarissa B. Juanico¹

¹ Institute of Human Nutrition and Food, College of Human Ecology, University of the Philippines Los Baños, College, Laguna 4031, Philippines

² Institute of Chemistry, College of Arts and Sciences, University of the Philippines Los Baños, College, Laguna 4031, Philippines

³ Institute of Food Science and Technology, College of Agriculture and Food Science, University of the Philippines Los Baños, College, Laguna 4031, Philippines

Abstract Nixtamalization is an ancient method of processing corn that is said to enhance the nutritional value of maize by improving protein quality, increasing calcium and niacin bioavailability, and reducing phytic acid levels, thus increasing iron digestibility and bioavailability. The main objective of this study was to determine the effect of different nixtamalization processes on the physicochemical and nutritional properties of quality protein maize (QPM) flour and evaluate its potential and acceptability as a flour substitute in Philippine salt bread baking, determined through sensory analysis. Three processes of nixtamalization were employed, namely, traditional, classic, and ecological. Nixtamalized QPM flours, combined with wheat flour in 30:70 ratio, were used in the product development and sensory evaluation of Philippine salt bread. Results revealed that nixtamalization contributed significantly in the pH, color, and particle size of nixtamalized QPM flours. There was a significant increase ($P \leq 0.05$) in the moisture, crude protein, crude fiber, crude ash, calcium, iron, niacin, lysine, tryptophan, total starch, amylose, amylopectin, resistant starch, and soluble fiber contents and a significant decrease in the crude fat, nitrogen-free extract (NFE), phytate, and insoluble fiber contents of QPM flours after nixtamalization. No significant difference was found in the zinc and total dietary fiber contents among the samples. The Philippine salt bread produced using nixtamalized QPM flours had a high overall acceptability based on two-step sensory analysis. QPM is greatly improved by the ancient technology of nixtamalization and nixtamalized QPM flour showed desirable contributions in terms of the nutritional value and sensory attributes of Philippine salt bread when used as a flour substitute or blend.

Keywords: Flour, Nixtamalization, Nutritional value, Philippine salt bread, Physicochemical properties, Quality protein maize.

Funding: This research was supported by grants provided by the Department of Science and Technology Accelerated Science and Technology Human Resource Development Program (DOST-ASTHRDP) scholarship and the Department of Agriculture-Bureau of Agricultural Research (DA-BAR).

Citation: Sunico, D.J.A., Rodriguez, F.M., Tũaño, A.P.P., Mopera, L.E., Atienza, L.M., and Juanico, C.B. 2021. Physicochemical and nutritional properties of nixtamalized quality protein maize flour and its potential as substitute in philippine salt bread. CMUJ. Nat. Sci. 20(2): e2021035.