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Comparison of Nutritional Characteristics of Non- and Nixtamalized Maize Flour

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Abstract

Maize, also known as corn, contains starch 72%, protein 10%, and fat 4% and is produced worldwide. It is the largest locally produced crop and the most important food source in South Africa. The processing and consumption of maize vary from country to country, with maize flour (hominy flour) and maize meal being the most popular products. Maize can be used to promote agro-processing (nixtamalization), a process that enhances the nutritional benefits of maize when cooked in alkaline compounds. The study aims to develop maize meal through nixtamalization to determine the nutritional content of nixtamalized maize flour (white and yellow) and compare it to non-nixtamalized maize flour. The nixtamalized and non-nixtamalized flour were analysed in terms of dry matter, crude protein (CP), fat including fibre (NDF and ADF), and the mineral content (Ca, Mg, Na, K, and P) by atomic absorption spectrometry. The crude protein of nixtamalized (61.59 g/kg AS IS) and non-nixtamalized white maize flour (59.53 g/kg AS IS) did not differ significantly. A significant difference was between white and yellow maize flour (nixtamalized 78.11 and non-nixtamalized 77.28 g/kg AS IS). The Fibre content (ADF) of nixtamalized white maize (26.44 g/kg AS IS) was less than non-nixtamalized 32.61 g/kg AS IS. The fat content differed significantly between nixtamalized white maize (37.33 g/kg AS IS) and non-nixtamalized 33.73 g/kg AS IS. Nixtamalized white maize (0.84 g/kg AS IS) contained more calcium than non-nixtamalized (0.18 g/kg AS IS). And there was a significant difference between nixtamalized yellow maize (1.07 g/kg AS IS) and non-nixtamalized 0.23 g/kg AS IS. Nixtamalized white maize (1.22 g/kg AS IS) and nixtamalized yellow maize (1.32 g/kg AS IS) contained more magnesium than non-nixtamalized white (1.12 g/kg AS IS) and non-nixtamalized yellow (1.25 g/kg AS IS). Significant differences were found between non-and nixtamalized maize flour. Therefore, the use of nixtamalized maize in new product development can impact the nutritional content of the final product. The newly developed products can contribute to reducing malnutrition and food insecurity in South Africa.