

Acceptance, Attitudes and Nutritional Content of Novel Nixtamalized Maize Products Developed for The South African Consumer

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Abstract

South Africa is well-known for its good quality maize that serves as a staple crop for over 80% of the country's population, additionally, it is also Africa's top maize producer. However, maize provides an unbalanced supply of essential nutrients such as the essential amino acids lysine and tryptophan. Moreover, the water-soluble vitamin B3 is biologically unavailable to humans. Inevitably, the long-term consumption of maize-based diets deficient in these nutrients can result in pellagra, which is a disease manifested by the characteristic symptom dermatitis on sun-exposed skin. However, the process of nixtamalization combats the above-mentioned by improving the nutritional, textural and sensory aspects, and the physicochemical properties of maize. Nixtamalization is the traditional process of preparing maize in Mexico. It involves cooking and soaking maize kernels in an alkaline solution, typically calcium hydroxide. The process advantageously allows bound nutrients to be more readily available for absorption, improves flavour and texture, as well as pliability and digestion. This study explored South African consumer's acceptance and attitude towards nixtamalization and novel nixtamalized maize products. Three products were developed: a vegetarian patty, a vegetarian nugget and a maize chip. Consumers' sensory perceptions were studied using the Just-About-Right task and a 9-point hedonic scale to determine consumers' acceptance of taste, aroma, texture and appearance attributes of the products. The maize chip gained acceptance by 75.0% of consumers for all attributes. Thereafter, the chips were prepared for nutritional analysis, which showed that the chips had a high energy content (2303 kJ/100 g), a protein content of 6.64 g/100 g, a higher insoluble fibre content compared to two commercial chips, 15.87 g/100 g of NDF and 1.32 g/100 g ADF respectively and a significantly ($p < 0.0001$) lower sodium content compared to two commercial maize chips. The chips were also high in fat (23.72 g/100 g) which was attributed to the chip being deep fried. Consumers' attitudes toward nixtamalization and nixtamalized maize products were determined through a questionnaire. Quantitative analysis concluded that most of the respondents were open to nixtamalization as a new processing technique as well as to newly developed maize products produced through nixtamalization.