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Abstract

Effect of Ohmic Heating Nixtamalization on the Structural and Physicochemical Characteristics of Instant Maize Flours and Their Relation to Starch Modifications †

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Abstract: This study investigated the changes in the physicochemical properties of maize starch on nixtamalized flours produced with ohmic heating (OH). Samples were prepared using the following OH process variables and levels: cooking temperature (85 and 90 °C), heating time (0, 5 and 10 min) and voltage (120 and 130 V). Changes were studied using their viscosity profiles, differential scanning calorimetry (DSC), X-ray diffraction (XRD) and scanning electron microscopy (SEM). Results indicated that flour viscosity was affected by increasing time and/or temperature, but also by greater electrical fields. This was due to gelatinization and electroporation, shown as damage of the starch granule in SEM. DSC and XRD indicated not only gelatinization and loss of crystalline structures, but also formation of new amylose–lipid interactions, stabilizing the starch system and causing lower peak viscosity.

Keywords: gelatinization; electroporation; pasting profile; resistant starch; sustainable nixtamalization

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