

## Radiation-induced modifications of starch

Dorra Ghorbel

University of Carthage, Tunisia

Wheat and potato starches were treated by different  $\gamma$ -radiation doses (0, 3, 5, 10, 20, 35 and 50 kGy). The effects of  $\gamma$ -radiation on the physicochemical, rheological, structural, thermal and morphological properties of the starch granules were studied. The water solubility index (WSI) was increased significantly. An increase in the swelling power (SP) was observed after irradiation treatment until 20 kGy, followed by a rapid decrease at higher doses. The Brabender Amylograph maximal consistency as well as the viscosity of the starch pastes decreased significantly with increasing irradiation dose. The presence of free radicals suspected to be responsible for the glycosidic-bonds breakdown and the polysaccharides depolymerization by radiolysis was confirmed by electron spin resonance (EPR). Structural analysis using Fourier transform infrared (FTIR) spectroscopy revealed a significant decrease in the intensity of the O–H stretch, C–H stretch, bending mode of water and bending mode of glycosidic linkages. The X-ray diffraction spectra showed that irradiation treatment did not influence the crystalline morphology of the starches studied. Apparent amylose content decreased significantly with increasing irradiation dose. Differential scanning calorimetry (DSC) thermograms showed that there was no significant difference in the gelatinization temperatures, as well as the corresponding transition enthalpy. Microscopic observations under scanning electron microscopy (SEM) and polarized light microscopy showed that the granules surfaces of starches in the dry state was apparently unaffected by irradiation. But after heat treatment of the starches suspensions, SEM observations revealed an increase in the starch granules destruction as irradiation dose increased.

dorragherbel@yahoo.co.uk

## Canonical correlation based consonance test for sensory panels of a Brazilian cheese

Eric B Ferreira

Federal University of Alfenas, Brazil

*Minas Padrão* is a kind of Brazilian cheese very popular in the country, especially in the southeast of the country. An experiment was performed regarding the addition of inulin (prebiotic) in doses 0, 2% and 4%; combined with 4 ripening times 0, 15, 30 and 45 days; yielding 12 treatments. Then, those treatments were evaluated according to 4 sensory attributes (appearance, color, flavor and texture) by a trained panel of 5 assessors. Such training lasted only for 4 one-hour sessions. A test based on canonical correlations was proposed for assessing the panel consonance. This test was performed in the panel scores setting the null hypothesis at 75% of consonance or more. This was rejected ( $p < 0.05$ ) and then each attribute was verified. An asymptotic test for Eigen values was performed revealing only one consonant attribute, the appearance. For color, flavor and texture specific retraining should be done with assessors 1, 2 and 5.

eric.ferreira@unifal-mg.edu.br