

Colour stability of cooked ham packed under modified atmospheres in polyamide nanocomposite blends

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Abstract

Two novel blends containing a low-density polyethylene (LDPE) and a neat polyamide (PA) or a polyamide nanocomposite (PAN) layers were fabricated and their technological potential was evaluated during the refrigeration of cooked ham in modified atmospheres (MAP). Nanoclays were homogeneously distributed and nearly exfoliated, and they lowered significantly the oxygen transmission rate (OTR) of the PAN films. Due to the lower OTR, the headspace oxygen level in PAN pouches do not rise above 0.26% but it approached 2% in PA pouches at day 20. The residual oxygen levels were key for colour change during MAP storage of cooked ham. Cooked ham redness and reflectivity were stable during 27 days in PAN pouches while a strong colour deterioration took place after day 7 in PA pouches. Other parameters such as moisture content and water activity remained unaltered, and pH development was related to microbial growth and independent of the packaging polymer. The evolution of cooked ham colour in PAN was comparable to a high-barrier commercial polymer, and was acceptable for commercial sale for 27 days, showing excellent perspectives for polyamide nanocomposites in the storage of cooked ham.