

Title Synergistic effect of tannic acid and modified atmospheric packaging on the prevention of lipid oxidation and quality losses of refrigerated striped catfish slices

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Abstract

Chemical, microbiological and sensorial changes of striped catfish (*Pangasius hypophthalmus*) slices treated without and with tannic acid (100 and 200 mg/kg) were determined during 15 days of storage at 4 °C in air and under modified atmospheric packaging (MAP, 60% N₂/35% CO₂/5% O₂). The slices consisted of 9.2 g lipid/100 g and the lipid contained 64.55% unsaturated fatty acids and 33.87% saturated fatty acids. During the storage, the sample treated with 200 mg/kg tannic acid and stored under MAP (M₂) had the lowest peroxide value (PV) and thiobarbituric acid-reactive substances (TBARS) with the coincidental lowest non-haem iron content, indicating the retarded lipid oxidation. Fourier transform infrared (FTIR) spectra indicated the formation of primary oxidation products and free fatty acids in M₂ sample after 15 days. Conversely, these compounds were found at lower contents in the control samples kept in air without tannic acid treatment (A₀), suggesting that the deterioration was more advanced. Myosin heavy chain of A₀ was degraded by 17.85% after 15 days of storage, whereas no change was noticeable in M₂, compared with the fresh sample (F). Based on microbiological acceptability limit (10⁷ cfu/g), the shelf-life of A₀ and M₂ was estimated to be 3 and 15 days, respectively. M₂ had the acceptable scores for all sensory attributes up to 15 days, while A₀ was acceptable when stored for 9 days. Therefore, tannic acid exhibited a synergistic effect with MAP on retarding lipid oxidation and microbial growth, thereby increasing the shelf-life of striped catfish slices during refrigerated storage.