

Effect of Marinating Chicken Breast Meat with Coconut Vinegar on Lipid Oxidation During Storage

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Lipid oxidation results both desirable and undesirable compounds in meat. These undesirable compounds adversely affect on overall quality and consumer acceptability of meat. This research was conducted to find out the effect of coconut vinegar on the lipid oxidation of marinated chicken breast meat (MCBM) during storage and to evaluate the physicochemical properties of MCBM. Marination solution was prepared with water, spices and different levels of vinegar where control contained no vinegar, treatment 1, 2, 3 and 4 had vinegar: water ratio at 1:0, 1:1, 1:2 and 1:3, respectively. Chicken breast meat was marinated with above solutions at 4°C for 24 hr. Cooked meat samples (internal core temperature of 75°C) from marinated treatments were then evaluated for sensory properties using a 7-point hedonic scale and 30 untrained panelists. Based on its results, the two best treatments were compared with the control in replicates for pH, color, texture, water holding capacity, cooking loss, uptake of marinade, proximate composition, TBARS value and microbial quality over a one-month storage period. Results showed that Treatment-3 and 4 had the best sensory properties according to the overall acceptability. Treatment-3 and 4 are comparable for pH and treatment 3 showed the highest lightness and yellowness values for day 0 when compared with the control ($p < 0.05$). Ash and crude protein contents were not affected ($P > 0.05$) by vinegar when subjected to marination. However, moisture content, crude fat content and marinade uptake were affected by the addition of vinegar ($P < 0.05$). The pH value declined gradually until the second week and then increased slightly during the third and fourth weeks for each treatment. *Salmonella* and *Escherichia coli* were not detected in any sample during storage. Colony count (Control: 0.58×10^{10} - 2.07×10^{10} CFU mL⁻¹, Treatment-4: 0.57×10^{10} - 1.9×10^{10} CFU mL⁻¹, Treatment-3: 0.41×10^{10} - 1.77×10^{10} CFU mL⁻¹) and TBARS values (Control: 0.173-0.831 MDA mg kg⁻¹, Treatment-4: 0.165-0.458 MDA mg kg⁻¹, Treatment-3: 0.161-0.408 MDA mg kg⁻¹) increased with the storage, but within the accepted limits. Based on the TBARS values coconut vinegar can be used to marinate chicken breast meat with the aim of reducing lipid oxidation.

Keywords: Meat quality, Vinegar, TBARS, Sensory