Effects of electron beam irradiation and antimicrobials on the volatiles, color and texture of ready-to-eat turkey breast roll


Abstract:

ABSTRACT: Breast rolls with 6 antimicrobial additive treatments—no preservatives (control), 0.1% potassium benzoate (PB), 2% sodium lactate (SL), 0.1% potassium benzoate plus 2% sodium lactate (PB + SL), 2% sodium lactate plus 0.1% sodium diacetate (SL + SDA), and 0.1% potassium benzoate, 2% sodium lactate, and 0.1% sodium diacetate (PB + SL + SDA)—were prepared. Samples were irradiated at 0, 1.0, or 2.0 kGy, and then the quality characteristics of turkey rolls were analyzed. Adding 2% SL increased the hardness, springiness, cohesiveness, chewiness, and resilience of breast rolls. Addition of PB or SDA, and irradiation had no significant effect on texture. Adding 2% SL affected color values. The color a* and b* values of turkey rolls with 2% SL added were significantly lower than those of the control, and this difference was maintained after irradiation and during storage. No difference in color and texture was observed between turkey rolls added with SL and those added with SL + PB + SDA. Breast rolls containing antimicrobials had more lipid oxidation than control. Irradiation and storage slightly enhanced lipid oxidation, although the overall lipid oxidation was very low. Irradiation promoted the formation of dimethyl disulfide and dimethyl trisulfide. Adding PB in breast rolls greatly increased the formation of benzene during irradiation, whereas other antimicrobial additives had no significant effects on volatiles.

Keywords:

e-beam irradiation • sodium lactate • sodium diacetate • potassium benzoate • turkey breast roll • quality

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