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Efficacy of the FreshLight® 210 Ultraviolet Light System¹ for Control and Elimination of *Listeria innocua* in a Commercial Poultry Marinade-Part B (Flow Rate = 8 GPM and Turnover Time 2.5 = minutes)

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Abstract: The presence of *Listeria* in marinade used to inject fresh whole muscle poultry products poses a potential threat to processors. In an attempt to offer a solution to this problem, two representative samples (20 gallons each) of fresh poultry marinade solution were collected on two separate days from a USDA-inspected poultry processing facility and were shipped overnight to MCA Services (Rogers, AR) under refrigerated conditions. Upon arrival at the laboratory, the marinade solutions were inoculated with overnight cultures of *Listeria innocua* to a level (colony forming units) of 5.0 logs per mL (Trial 1) or 6.6 logs per mL (Trial 2) of marinade solution. The inoculated marinade was then passed through a FreshLight® 210 ultraviolet light system (Safe Foods Corporation, N. Little Rock, AR) for 20 minutes (flow rate = 8 gallons per minute and solution turnover time = 2.5 minutes). Samples of the marinade were collected at 0, 2.5, 5, 7.5, 10, 12.5, 15 and 17.5 minutes which corresponded to 0, 1, 2, 3, 4, 5, 6 and 7 passes through the ultraviolet light system. Aerobic Plate Count Petrifilm™³ was utilized to determine log reductions in *Listeria innocua* due to the ultraviolet light treatment. In both trials, after only 2.5 minutes of ultraviolet light exposure (1 pass through the ultraviolet light system), a > 2.2 log reduction was achieved in the level of the inoculated culture in the marinade solution. At 10 minutes of exposure (4 passes), a 4 log or greater reduction was achieved in both trials. After 15 minutes (5 passes), *Listeria innocua* could not be recovered from the marinade solution in either of the two trials (the lower detection level for the organism was 1 log colony forming unit per mL). Thus, in 15 minutes of ultraviolet light system exposure, the total level of *Listeria innocua* in the poultry marinade was reduced in linear fashion from 5 logs per mL (Trial 1) or 6 logs per mL (Trial 2) to less than 1 log per mL (no detectable organisms). This represents a > 99.99% to a > 99.999% reduction in the original starting level of inoculum in the poultry marinade solutions. In conclusion, the commercially available FreshLight® 210 ultraviolet light system (FDA regulated under 21 CFR 179.39) offers an extremely effective means for controlling and eliminating the incidence and levels of *Listeria innocua* in poultry marinade solutions at a very low cost to the processor.

Key words: Poultry, marinades, *Listeria innocua*, FreshLight®

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