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Evaluation of the Citrilow™ Antimicrobial¹ at Various pH Values for Reducing the Natural Microbial Load on Beef Sub-Primals

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ABSTRACT

Currently the Citrilow™ antimicrobial (Safe Foods Corporation, N. Little Rock, AR) is utilized by the beef industry for treatment of product immediately before the injection machines. Citrilow™ is USDA-approved within a pH range of 0.5 to 2.0 (USDA 7120 Suitable Ingredients List). The objective of the following study was to evaluate Citrilow™, at two pH values, for use as a spray for sub-primals. To accomplish this, three whole brisket sub-primals were purchased from a local grocery store and were transported on ice to MCA Services (Rogers, AR). Upon arrival at the laboratory, the briskets were cut into 15 samples with each sample being 3 inches by 3 inches. A set of five of the brisket samples was placed on a wire rack and the surface of each piece was swabbed (controls). The brisket samples were turned over and sprayed for 5 sec with Citrilow™ (pH = 1.5) using a hand-held pump sprayer. The sprayed pieces were allowed to drain for 30 sec and were then swabbed using SpongeSicles™³ moistened in Butterfield's Phosphate Diluent. A second set of five samples were placed on a wire rack and again the first side of the brisket was swabbed as a control. The samples were then turned over and sprayed for 5 sec with Citrilow™ (pH = 2.0) using a hand-held pump sprayer. A third set of five samples was used as another control but this time the brisket pieces were sprayed with tap water for 5 sec using a hand-held sprayer. All samples were microbiologically evaluated in Butterfield's Phosphate Diluent for Aerobic Plate Count using Petrifilm™⁴. In addition, all samples were evaluated for any adverse sensory characteristics. The log Aerobic Plate Count for the first control was 3.7 while the Aerobic Plate Count for the brisket samples sprayed with Citrilow™ (pH = 1.5) was 1.9 logs (a 98.5% reduction). The log Aerobic Plate Count for the second control was 3.8 while the Aerobic Plate Count for the brisket samples sprayed with Citrilow™ (pH = 2.0) was 3.5 logs (a 50% reduction). The log Aerobic Plate Count for the water-sprayed control samples was 3.8; thus, the water itself did not reduce the bacterial load. There were no adverse sensory issues noted at the conclusion of the study. The results from this study demonstrate that a Citrilow™ spray at a pH of 1.5 is a very effective antimicrobial agent for beef sub-primals. In addition, Citrilow™ is commercially available, extremely cost effective and does not alter the organoleptic properties of the meat.

Key words: Citrilow™, beef sub-primals, antimicrobial, cost effective

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