



N Effect of a Reactive Oxygen Species-Generating System for Control of Airborne Microorganisms in a Meat-Processing Environment

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Abstract:

The effectiveness of reactive oxygen species (ROS)-generating AirOcare equipment on the reduction of airborne bacteria in a meat-processing environment was determined. *Serratia marcescens* and lactic acid bacteria (*Lactococcus lactis* subsp. *lactis* and *Lactobacillus plantarum*) were used to artificially contaminate the air via a six-jet Collison nebulizer. Air in the meat-processing room was sampled immediately after aerosol generation and at various predetermined times at multiple locations by using a Staplex 6 stage air sampler. Approximately a 4-log reduction of the aerial *S. marcescens* population was observed within 2 h of treatment ($P < 0.05$) compared to a 1-log reduction in control samples. The *S. marcescens* populations reduced further by ~4.5 log after 24 h of exposure to ROS treatment. Approximately 3-log CFU/m³ reductions in lactic acid bacteria were observed following 2-h ROS exposure. Further ROS exposure reduced lactic acid bacteria in the air; however, the difference in their survival after 24 h of exposure was not significantly different from that observed with the control treatment. *S. marcescens* bacteria were more sensitive to ROS treatment than the lactic acid bacteria. These findings reveal that ROS treatment using the AirOcare unit significantly reduces airborne *S. marcescens* and lactic acid bacteria in meatprocessing environments within 2 h.

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