

PORK SAFETY

Title: Effect of Ozone on *Listeria monocytogenes* and Shelf-Life of Ready-to-Eat Meat Products (Hot Dogs/Ham) - **NPB# 01-081**

Investigator: Siobhan S. Reilly

Institution: Oklahoma State University

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Abstract

Numbers of *Listeria monocytogenes* were reduced on hot dogs when exposed to ozone. The most effective treatment was exposure for 30 seconds (99% and 93 % reductions for 10^6 and 10^3 inoculums respectively). The 10-second exposure did reduce *L. monocytogenes* but not as effectively (60% and 30% reductions for 10^6 and 10^3 inoculums, respectively). *L. monocytogenes* was also reduced on ham slices when exposed to ozone. After a 30-second exposure, *L. monocytogenes* declined 42.4 and 56.1% for the 10^6 and 10^4 inoculum levels, respectively. A 10-second exposure resulted in only a 10.9 and 22.2% reduction for the same two inoculum levels.

No differences were apparent between the control and ozone-treated hot dogs or ham slices with respect to microbial shelf life. The bacterial counts (total aerobic and lactic acid) remained similar for the treated/control samples when stored for 28 days under refrigeration conditions (5 °C).

Although in most cases there was not a statistically significant difference in the TBARS-values and color attributes between the control and ozone-treated hot dogs, there was a trend towards an increased formation of oxidation products and changes in color as storage time progressed. This suggested that the ozone treatment may negatively affect some sensory attributes of hot dogs. However, sensory panelists could not detect a difference between ozonated hot dogs and non-ozonated hot dogs. For ham slices, the 10 and 30 second ozone treatments led to increased production of oxidation products when compared to the control (no ozone) but this did not adversely affect color. Sensory panelists were able to detect differences for both treated samples (10 and 30 seconds) when compared to the control.

Ozone gas may be an effective post-process treatment for controlling or eliminating *L. monocytogenes* on certain ready to eat meat products. In this study, ozone is clearly more effective in reducing numbers of *L. monocytogenes* on hot dogs compared to ham slices. In addition, sensory characteristics for ozone treated hot dogs remained unaffected; however, ham slices were negatively affected by the ozone treatment.

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For more information contact:

National Pork Board, P.O. Box 9114, Des Moines, Iowa USA

800-456-7675, **Fax:** 515-223-2646, **E-Mail:** porkboard@porkboard.org, **Web:** <http://www.porkboard.org/>