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### USE OF A NOVEL IN-PACKAGE OZONATION PROCESS FOR REDUCING SALMONELLA ENTERITIDIS ON CHICKEN MEAT

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**ABSTRACT** There exists a need to ensure food safety in regards to raw chicken meat. The goal of this research was to evaluate an in-package ozonation process on raw chicken meat to reduce pathogenic contamination of Salmonella enteritidis. A novel, patent-pending technology has been developed at Purdue University that generates ozone inside a sealed package. Ozone treatment is an approved method by the FDA (“GRAS”-Generally Recognized as Safe); and research has shown that ozone treatment has the ability to reduce pathogens and extend shelf-life. Research has shown ozone’s ability to reduce pathogens; results indicate significant reductions (3-5 log<sub>10</sub>) of E. coli O157:H7 on lettuce and spinach and Salmonella enteritidis on shell eggs, tomatoes, and raw chicken. Characteristics of this technology include: no heating, low power requirement (≤ 50 Watts), short treatment time (seconds to minutes), and adaptability into existing processes. The treatment process involves exposing the packaged chicken to a high voltage field (kilovolts) for seconds to minutes. During treatment, the gas inside the package (air, modified atmosphere, nitrogen) is converted into reactive ions (ozone, nitric oxide, etc.). This ionization process has been demonstrated using common packaging materials including: low-density polyethylene, high-density polyethylene, and polypropylene. For chicken packaged in air, approximately 1,000 – 2,000 ppm ozone can be generated in five minutes of treatment. After treatment, the ozone and other reactive ions slowly convert back to their elemental forms within 24 hours. Results indicate that this in-package ozonation process has the capacity to reduce Salmonella enteritidis on raw chicken meat.

**Keywords:** Ozonation process, bacterial reductions, chicken, Salmonella enteritidis, ozone