

## 2018 Reciprocal Meat Conference – Technical Summaries

## Meat and Muscle Biology™



## Utilization of Rosemary and Green Tea Extracts As Clean Label Antioxidant Solutions in Bacon Formulations

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## Objectives

The rising consumer preference for bacon as a center-of-the-plate item is associated with an increased demand for its food service applications. Maintaining flavor stability is critical where freezing without any oxygen barrier and a high variability in fat content and unsaturation of pork bellies can influence lipid oxidation and limit product shelf-life. Interest in natural cure ingredients is largely due to rising consumer demand for processed meats with clean label solutions. Rosemary and green tea extracts are naturally sourced antioxidants that could mitigate product quality issues while providing consumer-friendly labels. This research evaluated the effect of adding rosemary and green tea extracts on the keeping quality and shelf life of bacon using natural cure or conventional cure when stored in food service style packaging.

## Materials and Methods

Pork bellies were manufactured into bacon under commercial conditions according to industry standards at the Michigan State University Meat Laboratory. Bellies were injected with a base formulation of 1.5% salt, 0.8% sugar, and water. The treatments include: (i) Conventional Cure (phosphates; sodium nitrite; sodium erythorbate; Control), (ii) Conventional Cure + 0.1% Herbalox (Rosemary Extract; CCR), (iii) Natural Cure (half the sodium nitrite content of the Control from pre-converted vegetable juice powder, PVJP; 500 ppm ascorbic acid from cherry powder; NC) + 0.1% Herbalox (Rosemary Extract; NCR), and (iv) Natural Cure (half the sodium nitrite content of the Control from PVJP, 200 ppm ascorbic acid from cherry powder; NC) + 0.2% Duralox (Rosemary/Green Tea Extracts blend; NCRT). After smoking (94.3 to 98.6% yield) and chilling, sliced bacon slabs were packaged to simulate food service conditions (oxygen-permeable

polyvinyl lined boxes layered on wax-covered lined paper, frozen at  $-20^{\circ}\text{C}$ ) and stored for 45 or 90 d in the dark. Visual evaluation, lipid oxidation (hexanal, pentanal, heptanal) and descriptive sensory analysis were determined at the end of the respective storage times.

## Results

Lipid oxidation, measured as secondary oxidation products, increased in all treatments as storage time progressed. However, the addition of rosemary extract in conventionally cured bacon samples (CCR) improved oxidative stability as evidenced by lower concentrations of secondary oxidation markers after 45 and 90 d of frozen storage than the Control. Results of secondary oxidation products in naturally cured bacon samples (NCR, NCRT) have shown their comparable oxidative stability with the Control following 90 d of storage. Saltiness, Musty and Caramelized aromas and flavors assessed by a trained sensory panel were highest ( $P < 0.05$ ) in CCR while Brown/Grilled Meat, Smoky, Fatty, Herbal, Sweet and Aftertaste descriptors were similar ( $P > 0.05$ ) among all treatments following 90 d of frozen storage. Visual evaluation results showed all treatments to be acceptable across all storage periods.

## Conclusion

Addition of rosemary and green tea extracts can enhance the shelf-life of bacon throughout 90 d of frozen storage and help maintain their keeping quality during food service packaging conditions. It provides the meat industry with a highly effective alternative to replace synthetic preservatives so processors can meet consumer demand for clean label products without compromising product shelf-life and quality.