



## Influence of Iodine Value and Packaging Type on Quality Characteristics of Food Service Packaged Bacon Slices

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**Keywords:** bacon, iodine value, lipid oxidation, shelf-life  
Meat and Muscle Biology 1(2):80

doi:10.221751/rmc2016.076

### Objectives

The objective of this study was to determine quality characteristics of frozen bacon slices made from bellies categorized by iodine value (IV) and packaged in both aerobic and anaerobic packaging formats.

### Materials and Methods

Pork carcasses (72) were sorted based on IV's using a NitFom sensor into high (78 to 83 g/110g), medium (68 to 73 g/100g), and low (58 to 63 g/100g) IV categories with 24 carcasses per category. Bellies from both the right and left side of the carcasses selected were used, totaling 144 bellies. Bellies were processed into bacon using commercial processing methods. Bacon from the left and right side bellies were randomly assigned to either aerobic bulk food service or vacuum packaging. Each sliced belly was divided into 5 zones and a slice from each zone was taken and put on a divider sheet to get a representation of the entire belly. Ten divider sheets were used, representing 10 evaluation days (d 0, 28, 56, 70, 84, 98, 112, 126, 140, and 154). All bacon slices were stored at -17.8°C and evaluated for lipid oxidation and fat color at each evaluation day. Instrumental color analysis (L\*, a\*, and b\*) were recorded on fat color of slices at each day and thiobarbituric reactive substances (TBARS) were recorded on a homogenous sample representing the 5 belly zones from each storage period. The experiment was a split plot design, with fixed effects of IV categories (low, intermediate, and high) and packaging treatments (aerobic and anaerobic).

### Results

High, intermediate, and low IV categories yielded bacon slices with mean values of 76.9, 70.9, and 67.7

g/100g, respectively. Iodine value did not have a significant ( $P > 0.05$ ) impact on lipid oxidation in anaerobic or aerobic packaging schemes. However, TBARS values increased ( $P < 0.05$ ) from d 0 to d 28 and from d 28 to d 154, with TBARS values greater than 1 mg malonaldehyde/kg sample after d 28 in aerobic packaging. Bacon slices in anaerobic packaging had increased ( $P < 0.05$ ) TBARS values from d 0 to d 126, yet TBARS values remained below 1 mg malonaldehyde/kg sample until d 126. Bacon slices from the low IV category had greater ( $P < 0.05$ ) L\* values than slices from the high and intermediate IV categories in both packaging formats. The change in L\* values in the aerobic packaging was more pronounced than the anaerobic packaging. In aerobic packaging, high IV category produced increased ( $P < 0.05$ ) a\* values compared to the intermediate and low categories. Aerobically packaged bacon slices showed a decrease ( $P < 0.05$ ) in a\* values from d 0 to d 154. In contrast, anaerobic packaged bacon showed an increase in redness throughout the 154 d shelf-life. An increased storage time indicated an increase ( $P < 0.05$ ) in b\* value for both anaerobic and aerobic packaging formats, and anaerobic packaging formats produced a greater numerical change throughout shelf-life.

### Conclusion

To conclude, IV category had no effect on lipid oxidation in either anaerobic or aerobic packaging. As suspected, bacon slices stored in aerobic packaging formats showed increased lipid oxidation and a lighter, less red product throughout frozen storage. Funding for this project was provided by the National Pork Board.