



The Effect of Brine Temperature on Smokehouse Yield, Sensory Characteristics, and Color Scores of Bacon

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Objectives

The objective of this study was to determine if an increased brine temperature could impact smokehouse yield, sensory characteristics, and color scores of bacon.

Materials and Methods

Fresh pork bellies ($n = 30$) were randomly assigned to one of three brine temperatures: -1°C (COLD), 10°C (MED), and 21°C (WARM). Bellies were injected using a multi-needle injector at 13% of the green weight containing a 1.5% salt inclusion level. All bellies were heat treated in a smokehouse to 50°C . Bellies were chilled for 24 h to an internal temperature of 4°C . After chilling, weights were measured to calculate smokehouse yield. Bellies were tempered to -4°C , sliced 4 mm in thickness, and vacuum packaged into 0.22 kg packages. Samples from each treatment were placed under UV lighting to mimic a retail setting. Trained sensory and color panels were conducted on d 1, 7, 14, 21, 28, and 35. Panelists evaluated sliced bacon packages for cured color intensity, cured color characterization, cured color fading, and off odor. Samples were cooked in a convection oven for 15 min at 177°C and were evaluated for saltiness, oxidized flavor, and flavor intensity. Data were analyzed using the MIXED models procedure of SAS. Least-squares means were computed for each dependent variable, and statistically separated by a pairwise t -test with predetermined $\alpha = 0.05$.

Results

Green weight pump percentage, smokehouse weight percentage, and chilled weight percentage for

all treatments were similar ($P > 0.05$). Trained sensory panel results revealed no significant differences ($P > 0.05$) for salt flavor between treatments on d 1, 28, and 35. The MED brine was more acceptable than the COLD and WARM brines for salt flavor on d 7 and 14 ($P < 0.05$). Oxidized flavor on d 1, 7, 14, 21, and 28 were similar for all treatments ($P > 0.05$), but by d 35 the COLD treatment had significantly less oxidized flavor than the MED and WARM treatments. No significant differences ($P > 0.05$) were found for flavor intensity between treatments for each day. No differences ($P > 0.05$) were found between treatments on d 1, 7, or 14 for cured color intensity and characterization. However, on d 21 and 35 the MED brine temperature had the most intense cured color ($P < 0.05$). On d 35, cured color characterization for the MED brine revealed a darker cured color ($P < 0.05$) compared to the COLD treatment but was similar to the WARM treatment. Cured color fading showed no differences ($P > 0.05$) between treatments on d 1, 7, 14, 21, and 28. On d 35 the COLD brine exhibited significantly ($P < 0.05$) higher levels of cured color fading compared to both the MED and WARM brines. No significant differences were found between treatments for all days for off odor ($P > 0.05$); however, d 35 was significantly higher than all other days within treatments ($P < 0.05$).

Conclusion

Processing yields were not significantly affected by brine temperature. Salt flavor and flavor intensity were not affected by brine temperature. In conclusion, cured meat color and oxidized flavor can be affected by brine temperature.