Objectives

Increased intake of dietary sodium has been linked to hypertension and increased risk of heart disease. However, reduction of salt, specifically sodium chloride, in processed meat products can adversely affect production yield, flavor, and food safety. Because salt inclusion in bacon has both positive and negative effects on yield and quality, the objective was to determine the effects of salt level on processing yield, lipid oxidation, and sensory characteristics of bacon.

Materials and Methods

Bellies (N = 144) were selected within a specified weight range (5.8 to 6.6 kg) from 2 different sources (72 each). Within source, 24 bellies were randomly assigned to 1 of 3 targeted salt levels (food grade salt) in the final product: 1.2, 1.5, or 1.8%. Individual sliced weight of each bacon slab was recorded to calculate commercial slicing yield [(bacon sliced weight / bacon cooked weight) × 100]. Bacon samples, used for TBARS analysis, were stored at –29°C for approximately 0, 30, 60, or 90 d. Thirty-six samples (108 total) were randomly selected from each of the 3 salt treatment groups for sensory determination of saltiness, oxidized flavor, and oxidized odor, using a trained sensory panel. Initial sensory analyses were conducted at approximately 0 d and final sensory analyses were conducted at approximately 90 d after initial sensory analyses. Data were analyzed as a one-way ANOVA randomized complete block design. The model included fixed effect of salt inclusion level and random effect of source. Data for TBARS and sensory analysis were analyzed using repeated measures on the same experimental unit (cured belly) over time. The model included fixed effects of salt inclusion, storage time, and their interaction. Source was included as a random variable. A Tukey’s adjustment was used to adjust for multiple comparisons.

Results

Pump uptake (%) was approximately 1 unit greater (P ≤ 0.01) in 1.2% bellies compared with 1.5% and 1.8% bellies, which were similar to each other. Cooked slicing yield (%) was 2.9 units greater (P < 0.01) in the 1.8% bellies compared with the 1.2% bellies, but neither were different from 1.5% bellies. As salt inclusion increased, sensory saltiness scores increased (P ≤ 0.05) during both initial and final sensory analyses. Conversely, oxidized flavor and oxidized odor did not differ among treatments for either time point. Furthermore, lipid oxidation (TBARS) was not different among salt treatment levels within any storage period.

Conclusion

Increasing salt inclusion from 1.2 to 1.8% increased bacon slicing yield, slice count, and perceived saltiness of bacon, but did not affect oxidized odor, oxidized flavor, or TBARS regardless of salt inclusion level. Overall, reduction of salt content can adversely affect slicing yield, but does not affect cooked yield nor reduce the rate of lipid oxidation of bacon.