Meat and Muscle Biology™

Prediction of Sensory Texture Characteristics of Deli Meat Using Instrumental Analysis

B. Baker[1]*, C. Bratcher[1], L. Wang[1], and T. Jiang[2]

[1]Department of Animal Sciences, [2]Auburn University, Auburn, USA

Objectives

The objective Experiment 1 was to test different probes and settings than the typically prescribed research method utilizing Texture Profile Analysis (TPA) of 4 deli meat brands, Classic Oven Roasted Turkey (CORT), Brand Oven Roasted Turkey (ORT), Natural Oven Roasted Turkey (NORT), and Bulk Oven Roasted Turkey (BORT), to correlate to descriptive sensory data obtained from a professionally trained panel at a deli processing corporate office. The objective of Experiment 2 was to determine how slice number affects texture using 3 different types of deli meats, hard salami, original roasted turkey breast, and turkey bologna. Increasing the number of slices of deli meat analyzed from 1 to 5 slices stacked at a time.

Materials and Methods

For Experiment 1, three treatments (25% strain, 30% strain, and a distance of 5-mm) were applied to samples. A total of 15 samples per treatment were analyzed, with 3 readings per sample- totaling 45 readings per treatment. Texture analyzer settings were: the treatment being applied, a pre-test speed of 2-mm/s, test speed of 0.5-mm/s, post-test speed of 0.5-mm/s, and a trigger force of 5-g. For Experiment 2 texture analyzer settings were a distance of 5-mm, a pre-test speed of 2-mm/s, test speed of 0.5-mm/s, post-test speed of 0.5-mm/s, and a trigger force of 5-g.

Results

Experiment 1 showed treatment distance was able to correlate mean hardness with sensory amount of striations ($r = 0.85$ and $R^2 = 0.73$) and showed a 'good' correlation between mean chewiness and amount of striations ($r = 0.72$ and $R2 = 0.67$). Mean cohesiveness was a 'good' indicator of sensory fibrousness between teeth at treatment level 30% strain ($r = 0.71$ and $R2 = 0.70$). For Experiment 2, increasing stack size proved to be an 'excellent' predictor of sample mean hardness and chewiness for brands Hillshire Farms Hard Salami (HFHS) and Oscar Mayer Oven Roasted Turkey Breast (OMORT), and a 'good' predictor of mean hardness for Oscar Mayer Turkey Bologna (OMTB). Increasing the number of slices on brand OMTB showed this had an 'excellent' correlation between slice number and average springiness, while the other two brands (HFHS and OMORT) depicted 'good' correlations. Increasing the number of slices showed a 'good' correlation between brands OMORT and OMTB and mean cohesiveness and mean resilience.

Conclusion

In conclusion, some sensory attributes were correlated with texture profile analysis readings in Experiment 1; additionally, in Experiment 2, increasing the number of stacked slices showed to increase correlation coefficient (R^2) values in most cases.