Sensory Study of Ready-To-Eat Meats with Natural Antimicrobials

**Abstract**

Within the last few years, there had been and continues to be an increasing consumer demand for minimally processed, “natural,” “organic” or “clean-label” food products. The USDA Food Safety and Inspection Service has identified “natural” meat and poultry products as those without artificial flavoring, coloring ingredient, or chemical preservatives. Therefore, approved and commonly utilized synthetic antimicrobials effective in the inhibition of *Listeria monocytogenes* are prohibited under that definition.

This requires moving away from chemical additives and toward natural ingredients as replacements. “Clean-label” foods have simple ingredients easily understood and recognized by consumers. The ingredients originate from a nonchemical or plant source. New effective strategies must be developed by food industry producers that will inhibit *L. monocytogenes* growth in RTE meats while meeting clean-label, natural or organic labeling criteria. One method may be the use of organic acids, successful with inhibiting growth, such as acetic acid present in vinegar.

Therefore, the objectives of this study are to determine consumer acceptability of ham and frankfurters processed with the use of vinegar and/or high-pressure processing as natural antimicrobials as well as determine how each sample compares to the control samples processed with chemical preservatives.

**Study**

- **Required # of participants = 75**
- 1 oz. ham samples (served cold)
- 1 oz. frankfurter samples (served warm)
- Frankfurter samples boiled for one minute
- Portioned out into 4.1/2 oz. pieces
- Samples required to be tasted in order on the provided sheet to maintain randomization
- Rate samples using –
  - Nine Point Hedonic Scale for likeability, flavor, texture, aroma
  - Just-About-Right (JAR) scales

**Summary of Results**

- **Ham Samples** –
  - Overall likeability of all experimental samples significantly differed from the commercial sample through both tests in One-Way ANOVA but not from one another
  - Frankfurter Samples –
  - No significant difference found between the samples

**Conclusion:** Variation present between all experimental samples, though not any of significance from one another.

**Data Analysis**

- Calculated basic descriptive statistics
- Performed One-Way and Two-Way Analysis of Variance (ANOVA) for overall likeability of each sample
- Calculated significant differences using:
  - Fisher’s Least Significant Difference test
  - Tukey’s Honest Significant Difference test

**Sample Variations**

<table>
<thead>
<tr>
<th>Ham Sample #</th>
<th>Variables</th>
<th>Frankfurter Sample #</th>
</tr>
</thead>
<tbody>
<tr>
<td>845</td>
<td>Commercial Control</td>
<td>~~~</td>
</tr>
<tr>
<td>302</td>
<td>No HPP / No Vinegar</td>
<td>156</td>
</tr>
<tr>
<td>159</td>
<td>HPP / No Vinegar</td>
<td>348</td>
</tr>
<tr>
<td>246</td>
<td>No HPP / Vinegar</td>
<td>409</td>
</tr>
<tr>
<td>708</td>
<td>HPP / Vinegar</td>
<td>720</td>
</tr>
</tbody>
</table>

**References**


