Sensory Evaluation of Processed Meats

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Purpose
- Follow up & extension to recently published Fresh Meats Guidelines
  - Processed meats excluded
- Processed meats more complex
  - What factors to consider when designing?
  - Best practices to maximize test sensitivity

How does Sensory Testing Differ?

The sensory testing principles are the same, but with processed meat...

- More Factors to Consider
  - Carcass to carcass variability + muscle to muscle variability + processing parameters + preparation method* = increased complexity
  - More product categories to consider
  - More consumer segmentation and flavor preferences
  - BBQ Types, Spice level, etc.

- More complex questionnaire
  - Increased number of attributes, different scale types

Research Roadmap

1. Set a precise test objective
2. Select the appropriate test method
3. Execute the research
4. Analyze the data
5. Interpret the results

Points to consider when designing a test

What are you trying to learn?
How will the results be used?
How much variability is there within samples?
How big of a difference are you trying to detect?
How many factors do you need to test? DOE?

The answers to these questions will help determine...
- The right test method
- Sample size
- Location
- Target respondent
- How the test will be run
- Questionnaire design

Sensory Test Methods

QUANTITATIVE
- *Statistically Analyzed
  - Discrimination – method & panelist key
  - Triangle, Tetrad, Duo-Trio
  - Trained vs. untrained consumer
  - Consumer panelists screened vs. unscreened
  - Acceptance/Affective Testing (CLT, In-Home Use Test)
  - Hedonic, JAR, Intensity, Open-Ended
  - Descriptive Analysis

QUALITATIVE
- *Directional Guidance (fewer panelists)
- Focus Groups
- Online Message Boards
Determining the Test Method

- What is your hypothesis and/or objective(s)?
- Differences detectable or expected to be detectable?
- Discrimination panel to determine if differences are detectable.
- Descriptive analysis panel to characterize the differences.
- Quantitative Consumer Evaluations
  - Which one is preferred?
  - How do they differ in acceptability?
  - Preference test
  - Acceptance test with hedonics and intensity and/or JAR scales
- Qualitative Consumer Evaluations
- Differences detectable or expected to be detectable?
- Testing complete, test objectives met

Successful Sensory Testing

- Control all sources of variability
- Account & Accommodate for all sources of variability
- Target the right respondent

Control, Account, Accommodate: Sample acquisition

- Where were samples made/purchased?
  - Bench-top vs. Pilot Plant vs. pulled from production vs. grocery store
- Product Age and Storage
  - All samples tested at similar age
  - Minimum aging time – 14+ days
- How many batches/lots?
  - Academia – research focused, 3 reps
  - Industry - objective; cost/benefit/risk; production run vs. pilot plant
- How many pulls/packages within batch?
  - Reflect production run – beginning/middle/end
  - Whole muscle: carcass to carcass variability

Control, Account, Accommodate: Sample preparation

- Select preparation method based on test objective
  - If >1 preparation method:
    - Frequency of prep method
    - May not be the predominant cooking method
    - Best sensitivity & consistent product quality
    - More likely to uncover/result in detectable differences?
    - Use multiple preparation methods?

Control, Account, Accommodate: Product Holding Considerations

- Holding method selection
  - Minimum change to product integrity
  - Consistent temperature
  - Appearance, flavor, texture, breading texture
  - How typically held – foodservice, etc.
- Holding time
  - Establish minimum & maximum
  - Typical hold time - foodservice

Execute the Research: Serving considerations

- Standardize
  - Avoid introducing variability
  - Number of samples per session
  - Serving Temperature
  - Consistently achievable, yet allow for any sensory differences to be detected
  - Minimize taste bud fatigue
  - Flavor profile
  - Amount: Enough, but not too much
  - Representative sample
  - Account for variability
  - Don’t overwhelm
Execute the Research: Cheat Sheet

<table>
<thead>
<tr>
<th>Product</th>
<th>Amount</th>
<th>Special Factors to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinner sausage links</td>
<td>Serving size 2 1/2” to 3”</td>
<td>Trim off ends or include?</td>
</tr>
<tr>
<td>Hot dogs</td>
<td>1/2 to 1 whole link; 1/2” coins for DA texture analysis</td>
<td></td>
</tr>
<tr>
<td>Breakfast Sausage; Links</td>
<td>2 links</td>
<td></td>
</tr>
<tr>
<td>Breakfast Sausage; Chubs (Patties)</td>
<td>2 patties</td>
<td>Remove ends of chub and do not serve exterior slices.</td>
</tr>
<tr>
<td>Lunch meats (pre-sliced cooked meats)</td>
<td>Serve 1-2 whole slices per treatment.</td>
<td>Discard outer 1-2 slices from package due to color fading and damaged slices.</td>
</tr>
<tr>
<td>Bacon</td>
<td>2 slices</td>
<td>What degree of doneness?</td>
</tr>
<tr>
<td>Battered/breaded meats</td>
<td>2-3 nuggets, 1 strip, 1 fillet, 1 thigh, 1 breast</td>
<td>Do not store in a humid environment – i.e. wrapped in foil on a tray.</td>
</tr>
<tr>
<td>Whole Muscle Marinated Meats</td>
<td>2 oz slices</td>
<td>What degree of doneness?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With vs. without sauce/gravy?</td>
</tr>
</tbody>
</table>

Let’s taste some processed meats!

Questions?