Background & Objectives

The past few years have seen increased interest and resurgence in discussions surrounding the combination of food flavoring agents and their potential application beyond fine dining & the restaurant industry.

Methodology

Where it all started...
- The Initial Observation
- The Missing Piece of the Puzzle
- The Challenge

What if...
- Seasoned expert sensory panelists offer a wealth of combined sensory knowledge. Why not leverage their sensory capacity, descriptive expertise, ability to utilize perception and usage of color, texture, and aroma to enhance the flavor experience in food and beverage products?

Creating a Process

The Process – In a 2-Hour Session
- Intro & Innovation Exploration
- Create & Test Single-Ingredient
- Create & Test Mixtures & Next Steps
- Debrief – Findings and Next Steps
- Debrief – Thorough Review

The Stimuli – Over 140 Ingredients
- Flavor & Fragrance
- Sensory Highlights
- High Light
- Light Floral
- Light Green

Flavor Synergy Intervention
- High Balance and Blend: Complementing aromas
- Moderate Balance: Aromas complement one another but there is no noticeable aroma or flavor compound
- Low Balance and Blend: Flavors conflict, but some underlying characteristics; overall aromas are still off balance

Flavor & Fragrance
- Sensory Highlights
- Coiled Citrus
- Coriander
- Light Floral
- Light Tropea

Combination Ingredients
- Dried Orange Peel
- Nutt, Sweet, & Aromatic (000)

Contrast Synthesis
- Dried Orange Peel
- Nutt, Sweet, Aromatic (000)

Syringal Synthesis
- Nutt, Sweet, Aromatic (000)

The Criteria – Defining successful combinations
- Moderate success
- Low success

Richness of Information: Two hours later...

Conclusions & Applications

Conclusions
- Expert panels shorten the process of identifying successful flavor combinations and document the reasons for this success.
- In this project, three orange substrates (fresh, orange, and orange marinated) were combined with 140 ingredients to identify single and multi-component flavor combinations by 10 Spectrum-trained panelists.
- One 2-hour session yielded over 230 flavor combinations, ranging from “mainstream” combinations to some unique experiences.
- Panel expertise leveraged to document characteristics of successful and unsuccessful pairings, using descriptive terminology/lexicon.
- Two varieties of successful ingredient combinations were identified
- Synergistic synergies offer high balance and/or blend. Within that group, one flavor component may be enhanced and supported by complimentary flavor characteristics (enhancement).
- Contrast synergies offer interesting contrast in flavors and/or feeling factors by adding flavor constructs not initially present in the original flavor ingredient

Applications
- The breadth and depth of the sensory experience and expertise of a well-trained panel is combined with creative problem solving tools and process often used in consumer co-creation to yield great insight in a short amount of time.
- The use of a rigorous, systematic and scientific process offers potential for early identification of successful flavor synergies, resulting in the ability to create innovative products, while significantly shortening the development process.
- The use of experienced Spectrum-trained panelists for quick and high yield results can be applied to numerous product and ingredient screening projects.

Results and Key Insights

Key Insights – The Flavor Component is Key
- While some flavors successfully blended with fresh orange, they did not pair well with other orange substrates and vice versa. This reinforces the concept that not all orange flavors (or flavor combinations) are created equal. Flavor creation must rely on individual ingredients and their unique sensory experience.

Single Ingredient Findings – What works? What doesn’t work?

Multi Component Combinations – Areas to Explore Further