Understanding Flavor Complexity: What Individual Attributes Can’t Tell

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A classic Product Description

- Wheat
- Yeasty
- Sour Aromatics
- Bitter
- Salty
- Sour
- Doughy
- Musty (damp, earthy)
- Musty (dusty, old leather)
- Oily
- Dairy Sour
- Lemon
- Malic Acid
- Vinegar
- Astringency
- Tongue Numbing
- Sweet
Sensory Description

• In the 1940’s and 50’s the Flavor Profile was developed by Arthur D. Little, Inc.

• Researchers recognized that part of the sensory description was unable to be described as a specific attribute
  – Called it amplitude
  – The balanced, blended, fullness of the flavor in the mouth.
  – Measured as low, moderate, or high
Criticism of “Amplitude”

- Not an attribute
- Not really measureable
- Too dependent on panel
- Really just a measure of liking
- Amplitude fell out of favor
  - Different term “overall impact” became more common
  - Even that is not in common use
Describe “same” but “different”

- Complexity
- Interaction is key, but we lose that in describing individual attributes
- Not about the combination of “notes” into a different characteristic
- Is about the combination of “notes” into a different “experience”
Same, but Different - Describe

From guymer.deviantart.com
Research Project - People

- Kansas State University
- Sensory Spectrum
- Wolf Sensory
- Frito Lay
- Tallinn Technological University
- Kasetsart University
- Assumption University
- King Mongkut University
Research Project - Products

• 20 samples of Gelato
• Intentionally chose various flavors that would be difficult to describe on the same lexicon
• Varied in manufacturer
• Florence, Italy
Research Project – What we did

• Discussed “Complexity” prior to trip, by e-mail and telephone.
• Met and tasted products
• Discussed more: everyone on the same page – multifaceted
• Discussed terms and definitions
• Tasted products refined terms and definitions
• Tasted products, came to consensus on scores.
Impact

• The maximum overall sensory impression during early mastication.
  – Scored either at initial consumption or the first few seconds in order to provide time for the sensory properties to bloom.

• Note:
  – Provides the most information if scored relative to the product category.
Blended

- The melding of individual sensory notes such that the products present a unified overall sensory experience as opposed to spikes or individual notes
Balance

• The extent to which the sensory notes are in proportion and complementary to each other.
Complexity

• The existence of multiple sensory attributes or sensory layers that make up a singular sensory experience.
Longevity

- The time that the full integrated sensory experience sustains itself in the month and after swallowing
Fidelity

• The total sensory experience of the trueness of the product in the stated context; its believability.

• Note:
  – Fidelity cannot be scored if testing is blind.
  – Fidelity may not be appropriate for innovative prototypes.
  – The same product could have varying fidelity depending on regional or cultural perspectives.
Amplitude

• The integration of impact, balance, blended, complexity, and longevity that presents a unified, full sensory experience.
Integrity

• The integration of Impact, Balance, Blended, Complexity, Longevity, and amplitude with Fidelity that presents a unified, full sensory experience that compliments the stated expectation.

Not measureable unless Fidelity is measured.
Amplitude and Integrity

• These terms represent the “Personality” of the product. A product with a complete “personality” that is full, “blooms”, and sustains itself will be high in amplitude/integrity.

• When all aspects are high the overall amplitude/integrity will be high. When one or more of the aspects are reduced the Amplitude may be reduced, but not necessarily.

• These aspects may vary in their influence. For example, if Fidelity is known and is low, the Integrity is dramatically reduced.
Conclusions

• Good agreement on terminology
• Good Agreement on the application of the terminology
• Terminology differentiates products – particularly manufacturers of gelato samples
• Differentiates in a way that traditional flavor attributes cannot.