How Sensory Cues Affect Snacking Behavior: A Case Study of Apples

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Abstract
Snacking behavior among Americans is on the rise, with snacks often replacing full meals. As consumers are also becoming more health-conscious, demand for healthy snacking alternatives is increasing. In fact, fast food restaurants such as Subway, Wendy's, McDonald's and Chick-fil-a now offer fresh fruit as a side item, as an alternative to French fries or chips. Apples in particular are of interest because of their wide popularity and recent availability as a pre-sliced and individually packaged food item.

Our research aims to better understand the sensory cues of a variety of apples and how these cues affect behavior and snacking choices, with a specific focus on women and their children.

Descriptive analysis was conducted on 25 different apple varieties, including 3 pre-sliced and pre-packaged apples. Data was analyzed by PCA resulting in 4 flavor dimensions (26 flavor attributes) and 5 texture dimensions (20 texture attributes). From the results 3 apple varieties were selected to be shown in a Community Narrative Panel, preselected to be mothers of school-age children. These apple varieties were shown to consumers both raw and dried. Consumer discussion focused on sensory cues that suggest whether a product is good for their child, themselves, or both. Insight was gathered on the trade-off between convenience and taste.

Results

Top Choices for Snacks
- Moms seek to fulfill emotional and functional needs with snacks.
- Moms want healthy and filling satisfying snacks for their children, which are also portable (i.e. not messy "on-the-go").

“Must-Haves” for Snacks
- healthier
- Portion of a snack
- a treat
- "My mom’s or dad’s favorite"

snack

Flavor Map: Factors 3 vs. 4

Flavors: Buttery (18%), Honey Crisp (13%), Gala (11%), Pink Lady (10%), Fuji (9%), Rome (8%), Delicious (8%), Red Delicious (8%), Cosmic Crisp (6%), Granny Smith (6%), Stemilt (5%), Century (3%), Honeycrisp (1%), Unidentified (1%)

Tableau Venn Diagram of apple sensory profile showing some overlap in terms of sweetness and fruitiness attributes, while other attributes are more unique to each apple variety.

Conclusions
- Moms do not perceive dried apples to have any benefits over pre-sliced apples.
- Pre-sliced apple flavor should be improved – should have characteristics of Honey Crisp or similar apples.
- There is room to grow in the pre-sliced apple category in terms of flavor improvement.
- Pre-sliced apples can be improved as snacks by providing dipping sauce (e.g. chocolate, caramel, yogurt). This appeals to both moms and children.