A collection of molecular models. At the top left, a complex molecule with a central blue sphere, a yellow sphere, and several green spheres. Below it, a simpler molecule with a central grey sphere and several white spheres. The models are rendered in a 3D ball-and-stick style with soft shadows.

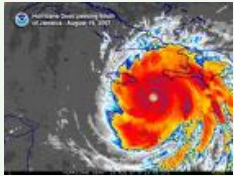
***Flavor and Consumer Science for Supply Security and
Flexibility in the HLB Era***

***Yu Wang
Packinghouse Day
August 24, 2017***

Citrus Supply Risks



Freeze



Hurricane

Inclement Weather



Regulations

Others



Canker



HLB



CTV



Black spot

Diseases

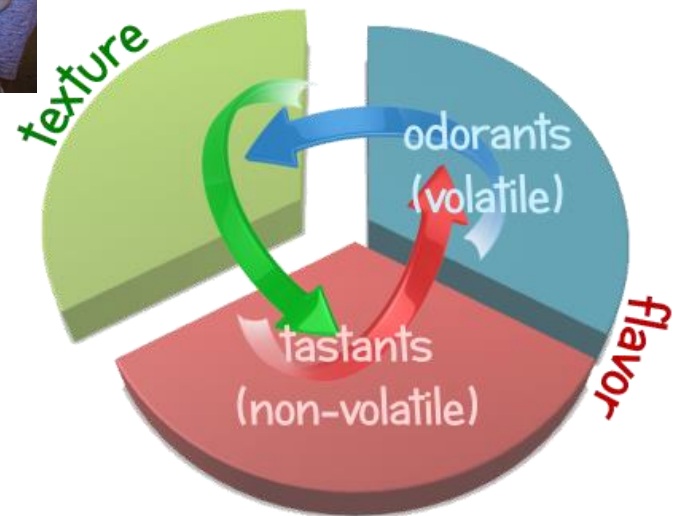
- **Raw Material Supply Security & Flexibility**
- **Signature & Quality**

Solution for Extreme Supply Scenarios



Flavor and Consumer Science

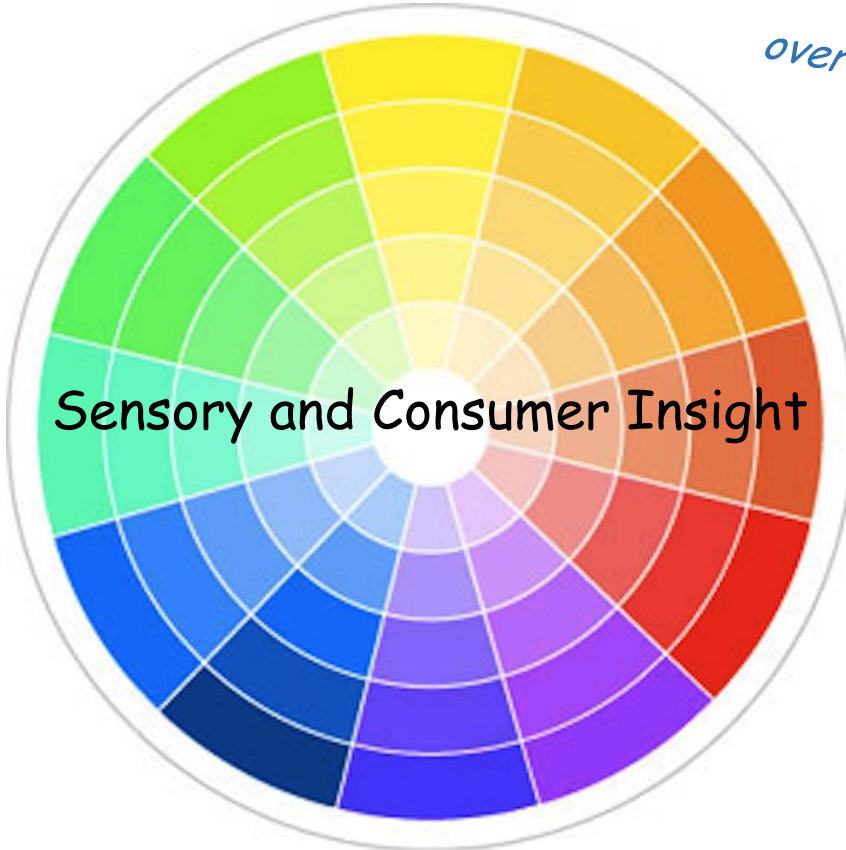
The **consumer** is the key driver for product success in the contemporary marketplace.



Flavor is key to consumer preference ...



Consumer Acceptance



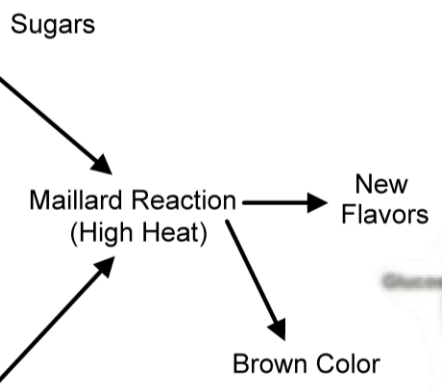
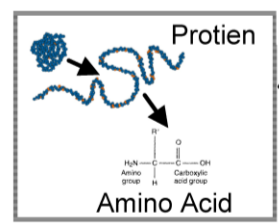
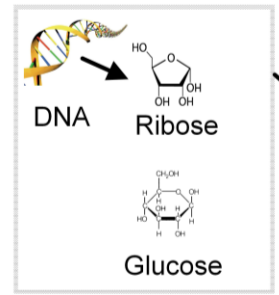
texture *flavor* *bitterness*
Sensory Attributes
overall appearance *sourness* *sweetness*

gender *eating history*
Demographic Factors
education level *race* *attitude*
age *genetics*

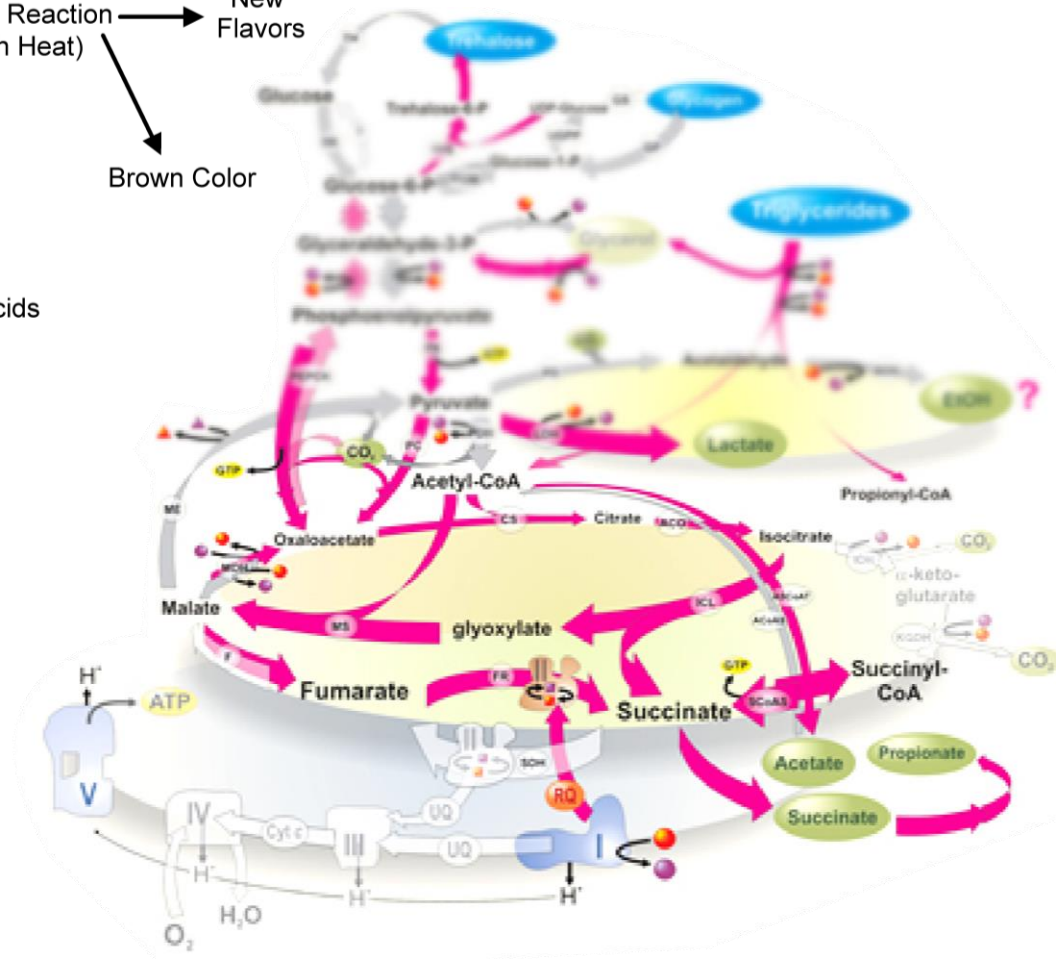
Flavor ... its origin and fade is complex



Raw Materials

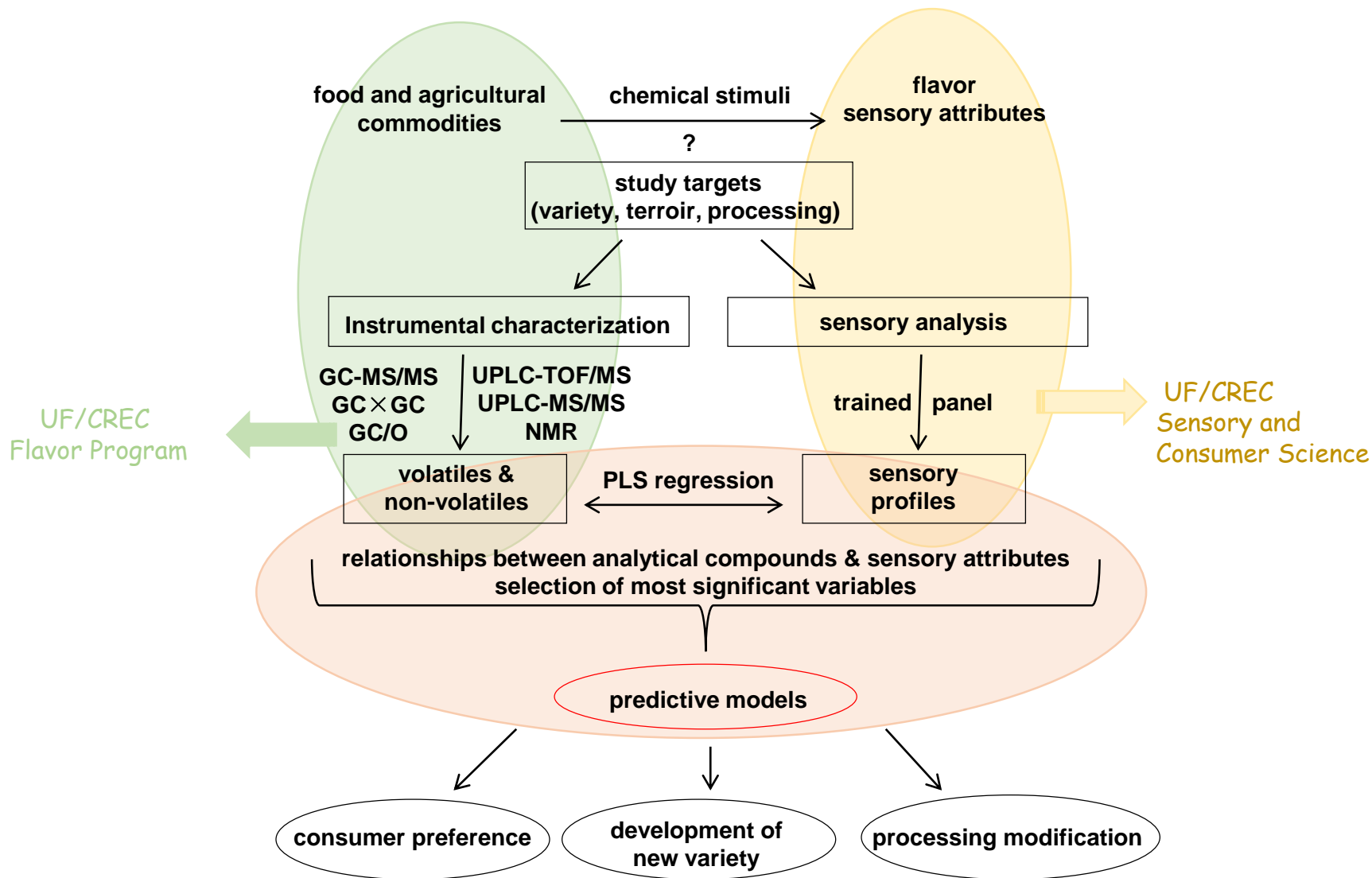


Process

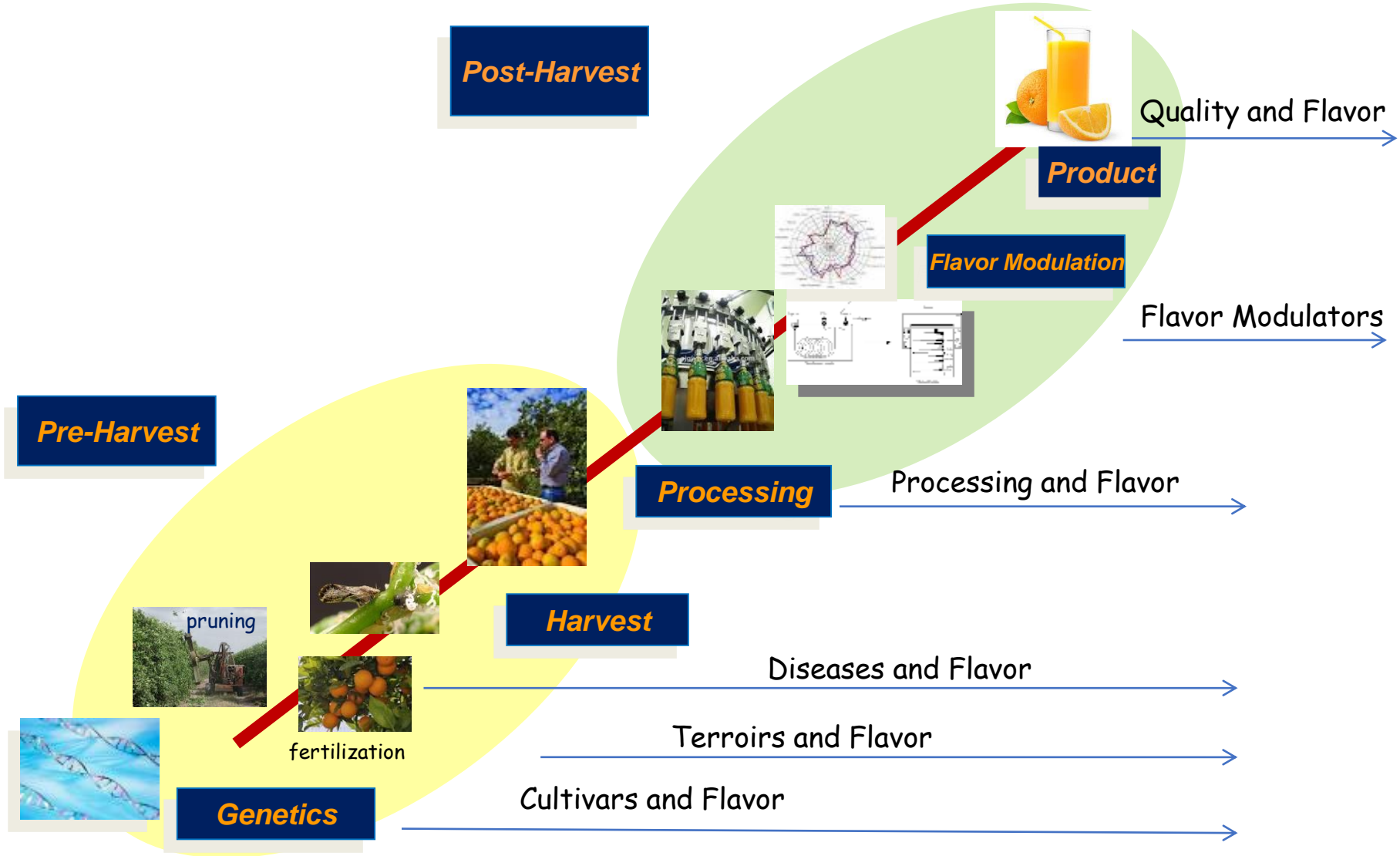


Shelf Life

Flavor and Consumer Science



Citrus Flavor Factors

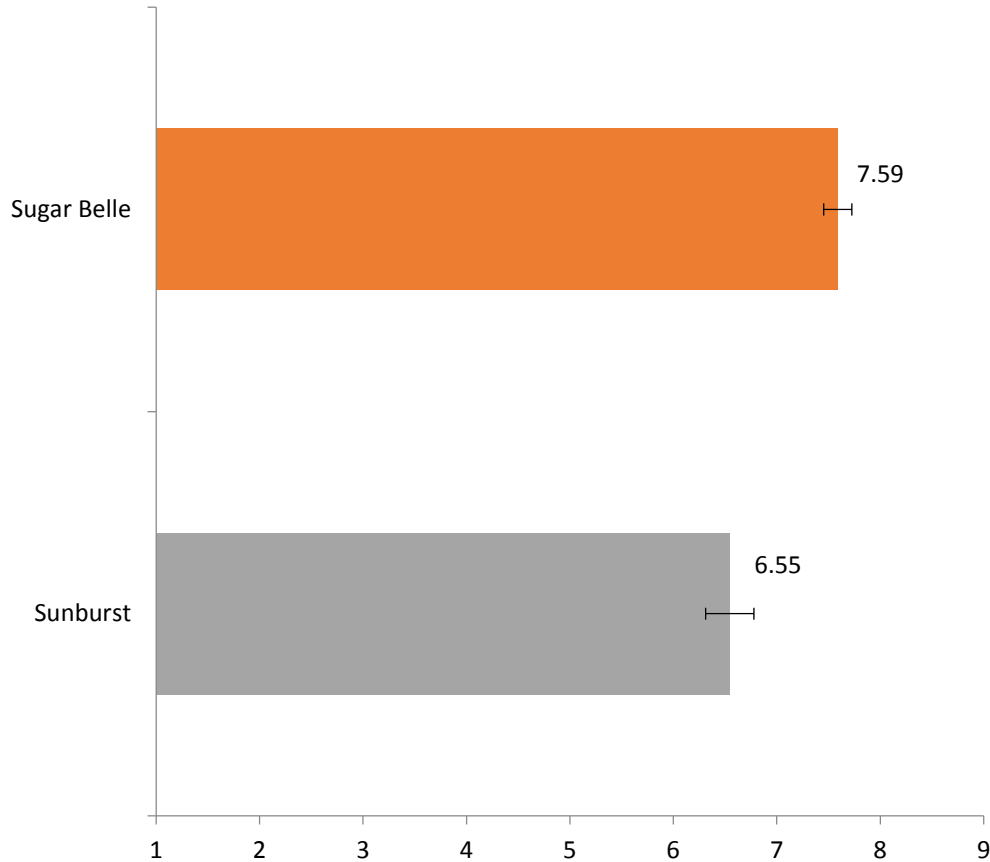




Sugar Belle VS. Sunburst

Sugar Belle VS. Sunburst

overall acceptance

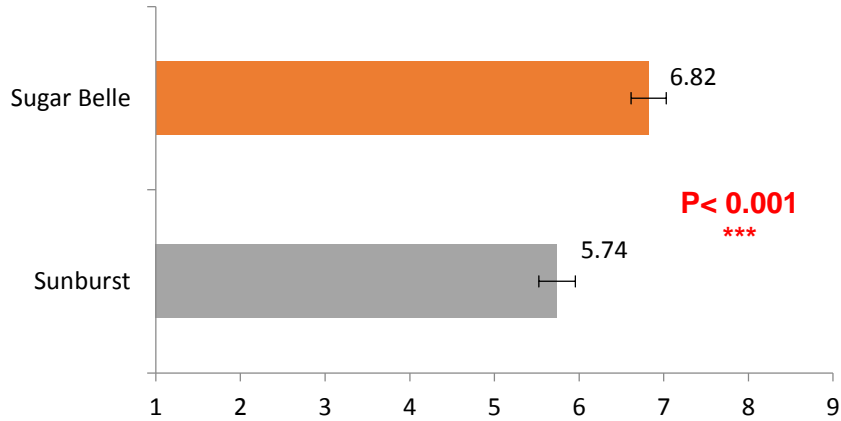


P < 0.001

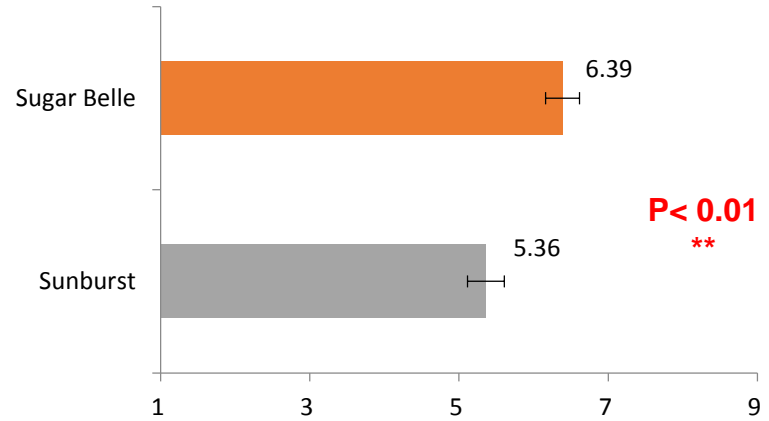
9-Point Hedonic Scale	
9	Like Extremely
8	Like Very Much
7	Like Moderately
6	Like Slightly
5	Neither Like nor Dislike
4	Dislike Slightly
3	Dislike Moderately
2	Dislike Very Much
1	Dislike Extremely

Sugar Belle VS. Sunburst

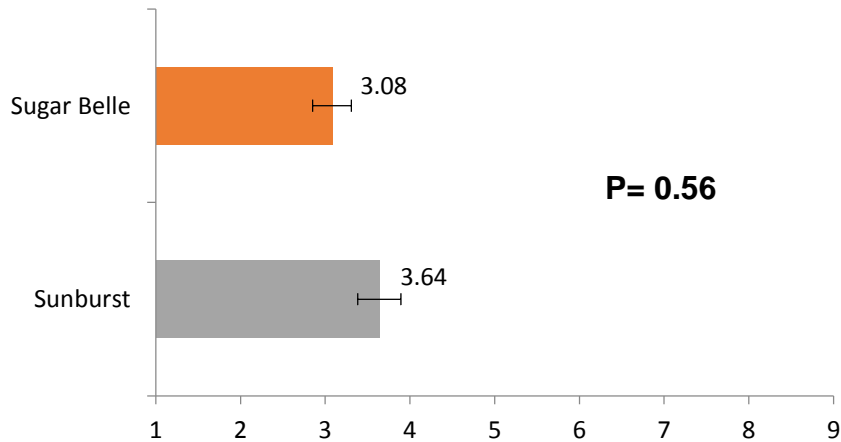
overall flavor



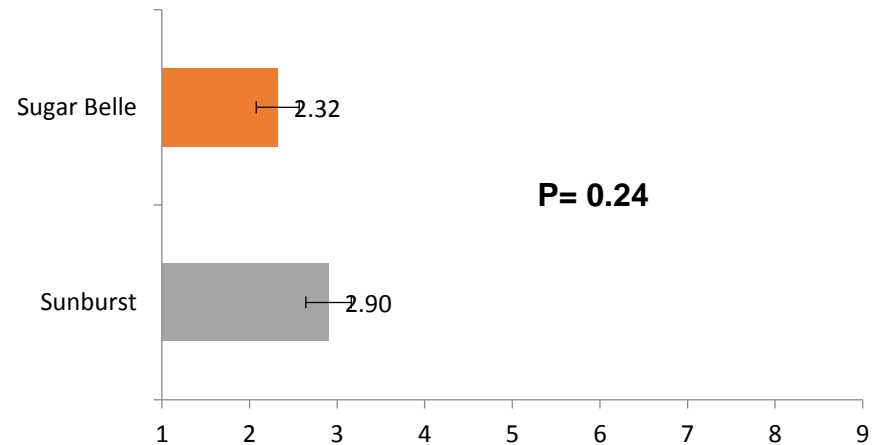
sweetness intensity



sourness intensity



bitterness intensity





THE

TAKE-HOME MESSAGE

Sugar Belle VS. Sunburst

Overall Acceptance



Overall Flavor



Sweetness



Sourness



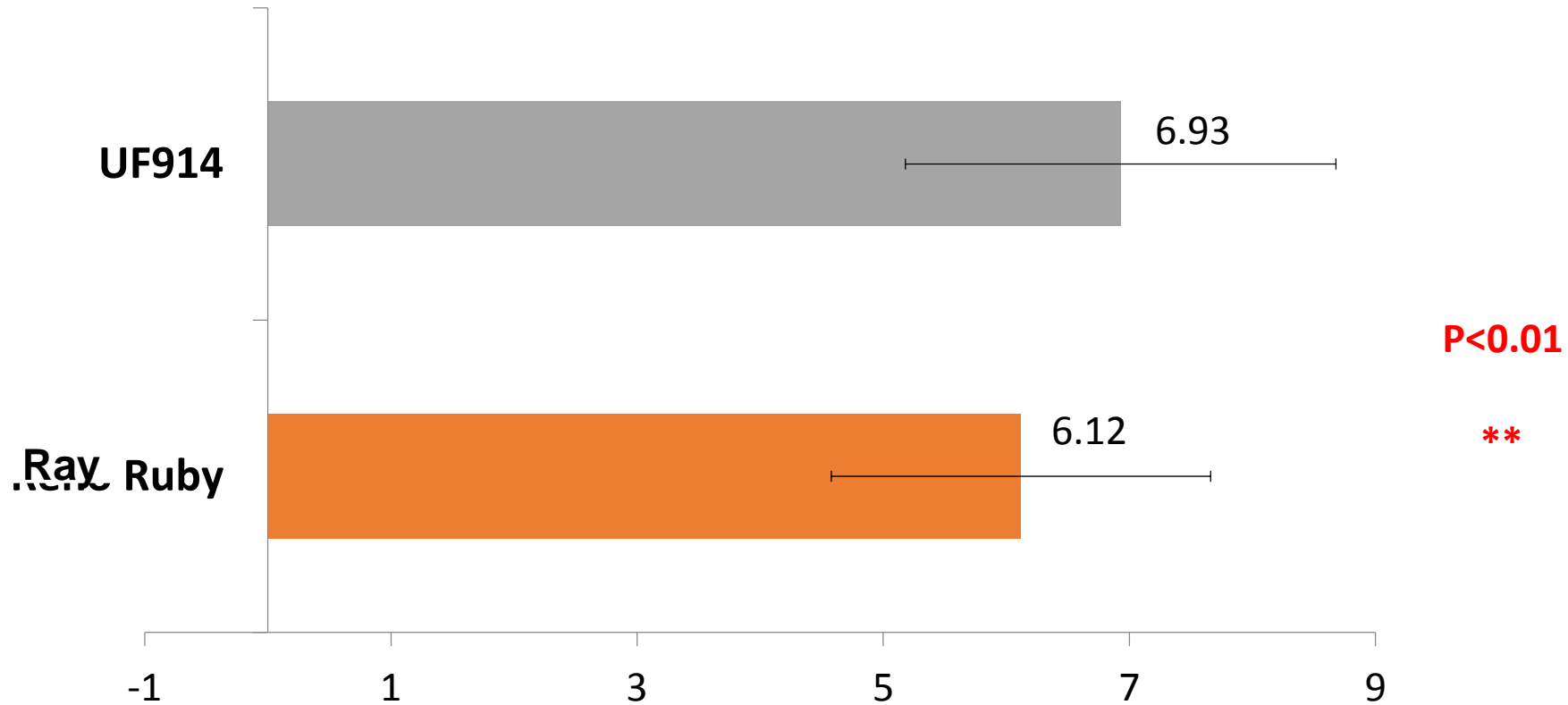
Bitterness



UF914 VS. Ray Ruby

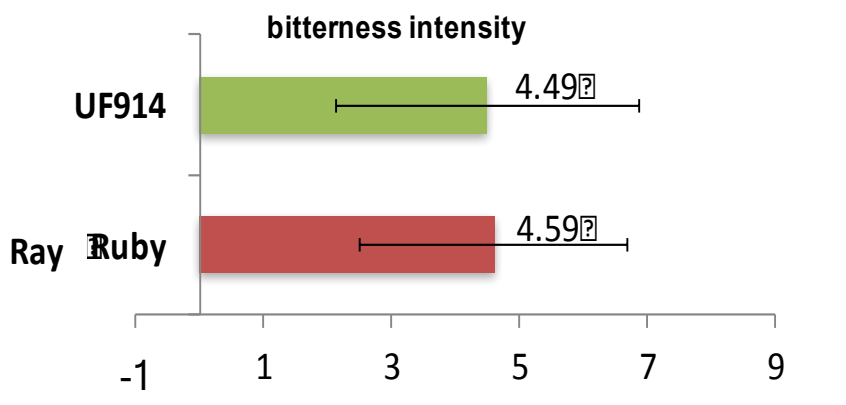
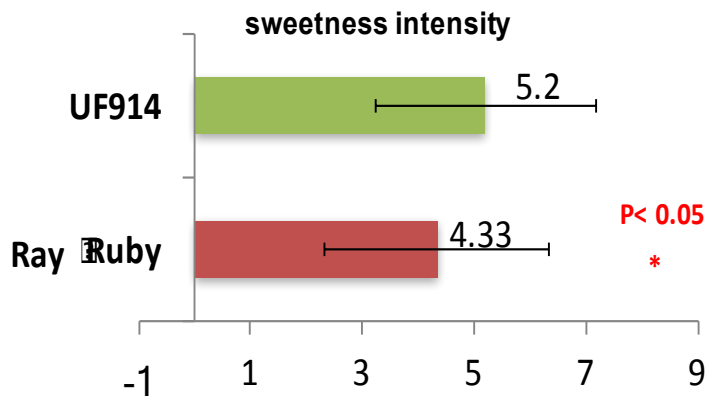
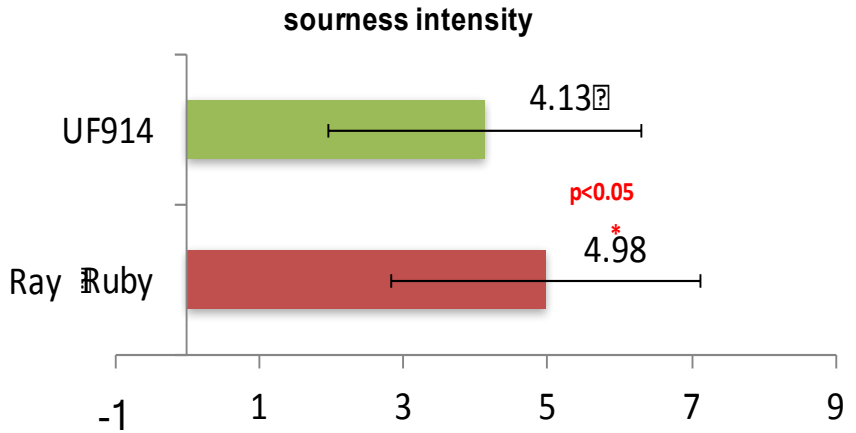
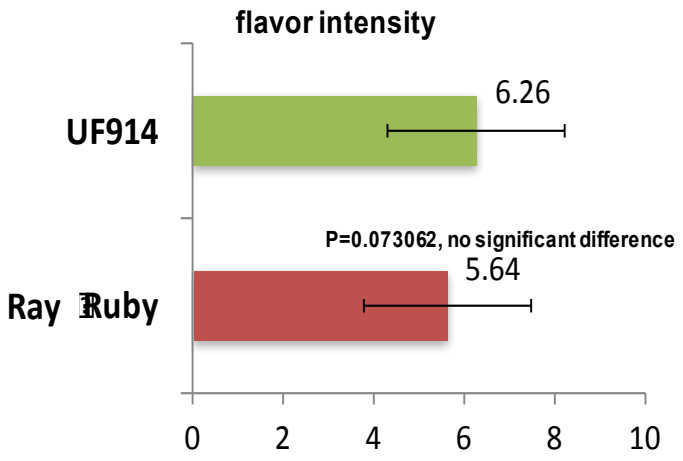
UF914 VS. Ray Ruby

Overall acceptance



The difference of overall acceptance between two varieties is statistically highly significant based on ANOVA analysis.

UF914 VS. Ray Ruby





THE

TAKE-HOME MESSAGE

UF914 VS. Ray Ruby

Overall Acceptance



Overall Flavor



Sweetness



Sourness



Bitterness



Flavor and consumer Database for Citrus Variety

950 VS Cuties

55 people
Age range: 22---65

Flavor

Overall Flavor

Sweetness

Sourness

Bitterness

Texture

Melting

Firm

Chewy

Interior
Color

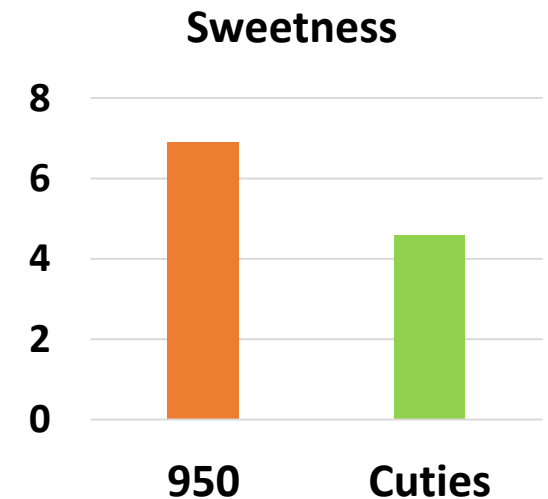
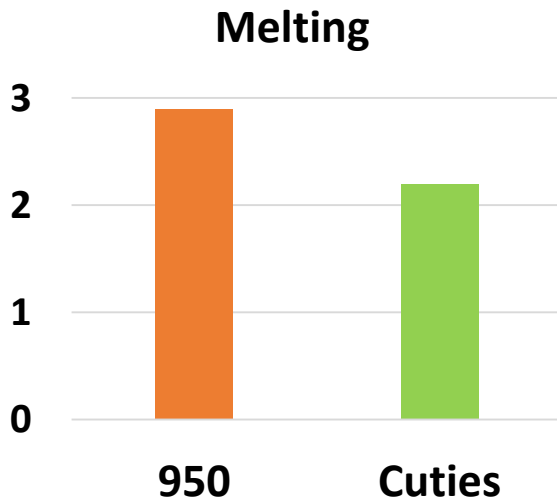
Sample
Preference

Flavor and consumer Database for Citrus Variety

49 out of 55 people prefer 950



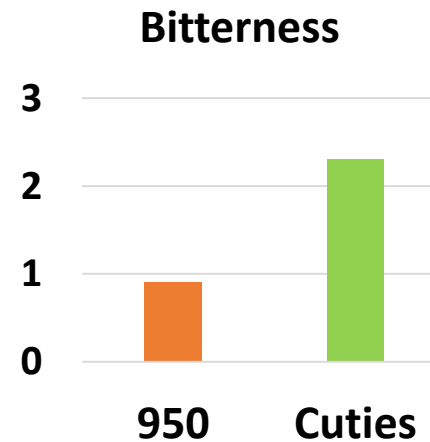
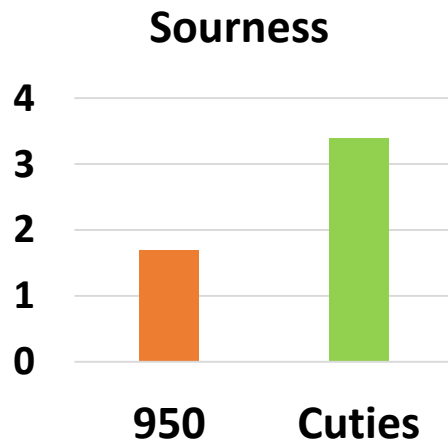
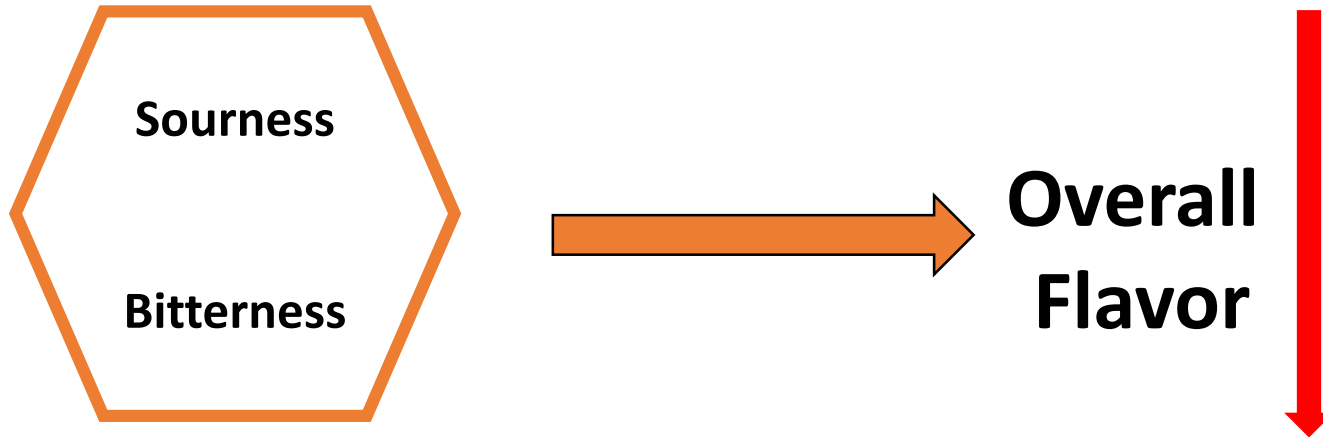
Overall
Flavor



$p < 0.05$

Flavor and consumer Database for Citrus Variety

49 out of 55 people prefer 950



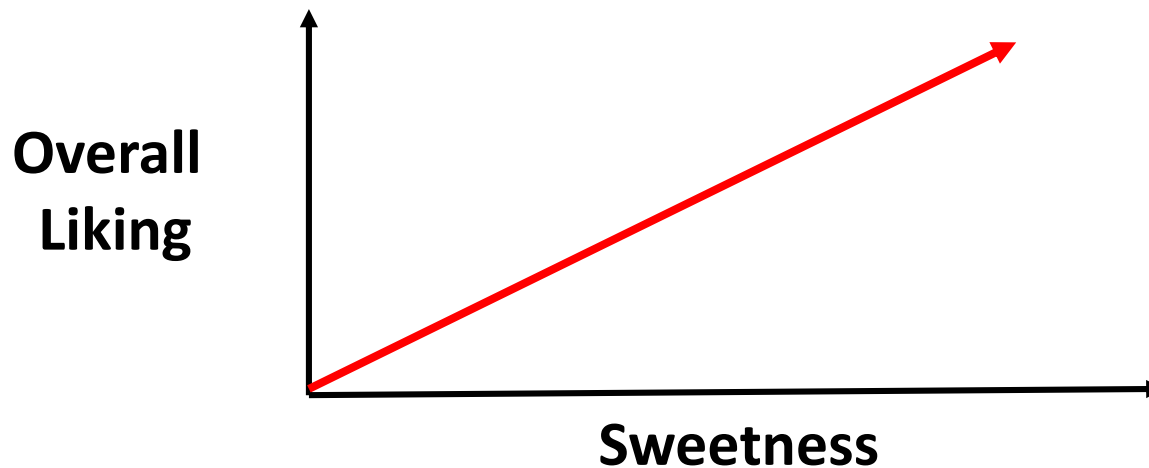
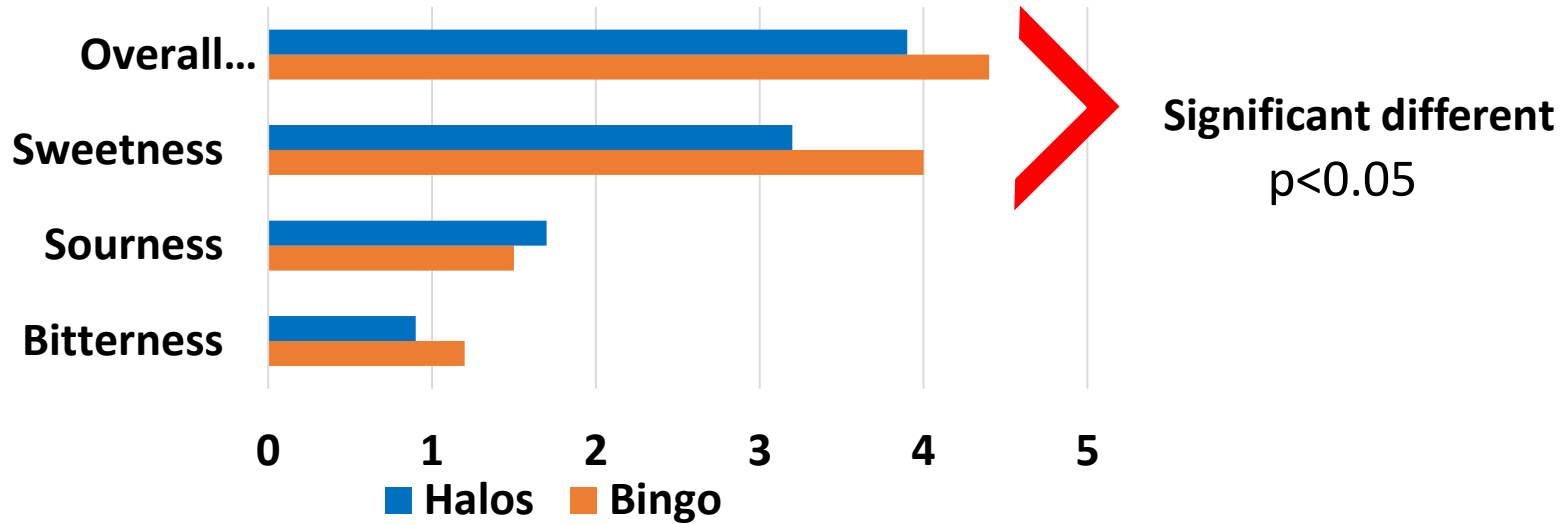
$p < 0.05$

Flavor and consumer Database for Citrus Variety

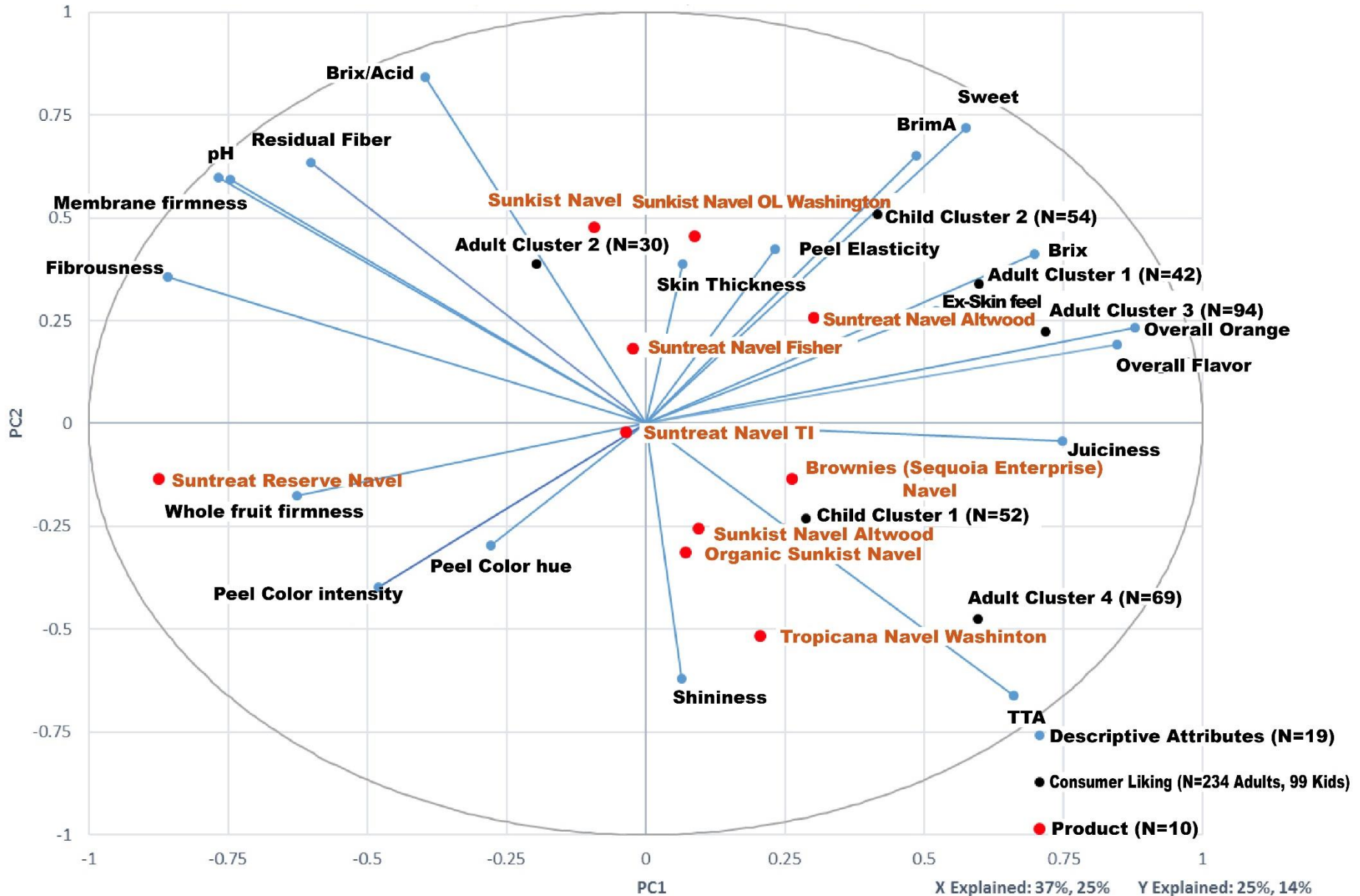
Bingo vs Halos

47 panelists

Age: 3 to 65



CRB Navel Orange Liking





THE

TAKE-HOME MESSAGE

- Adult consumers tend to cluster into more groups than those of children.
- The majority of adults and children are positively driven by sweetness, overall flavor, juiciness, and ease of peel while a distinct group of adult consumers show a strong preference for more acidic fruit.
- The current maturity index used by citrus growers, Brix/Acid ratio, was not consistent in predicting consumer liking.
- Fruit texture is an important driver for consumer liking.

Year 2017-2018

Fruit Display Day



1. Flavor and consumer science study for HLB tolerant varieties

2. Support growers for choosing the right new varieties

