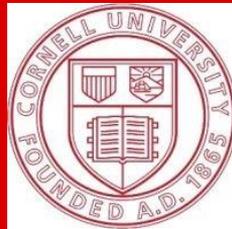


Developing Evaluation Programs to Improve Cider Making



CORNELL ENOLOGY EXTENSION LABORATORY
NYSAES, GENEVA

Quality?



Quality?



Quality (ISO)

- The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs
- **Degree to which a set of inherent characteristics fulfills requirements**

Fitness for purpose

How do we monitor/ assess quality?

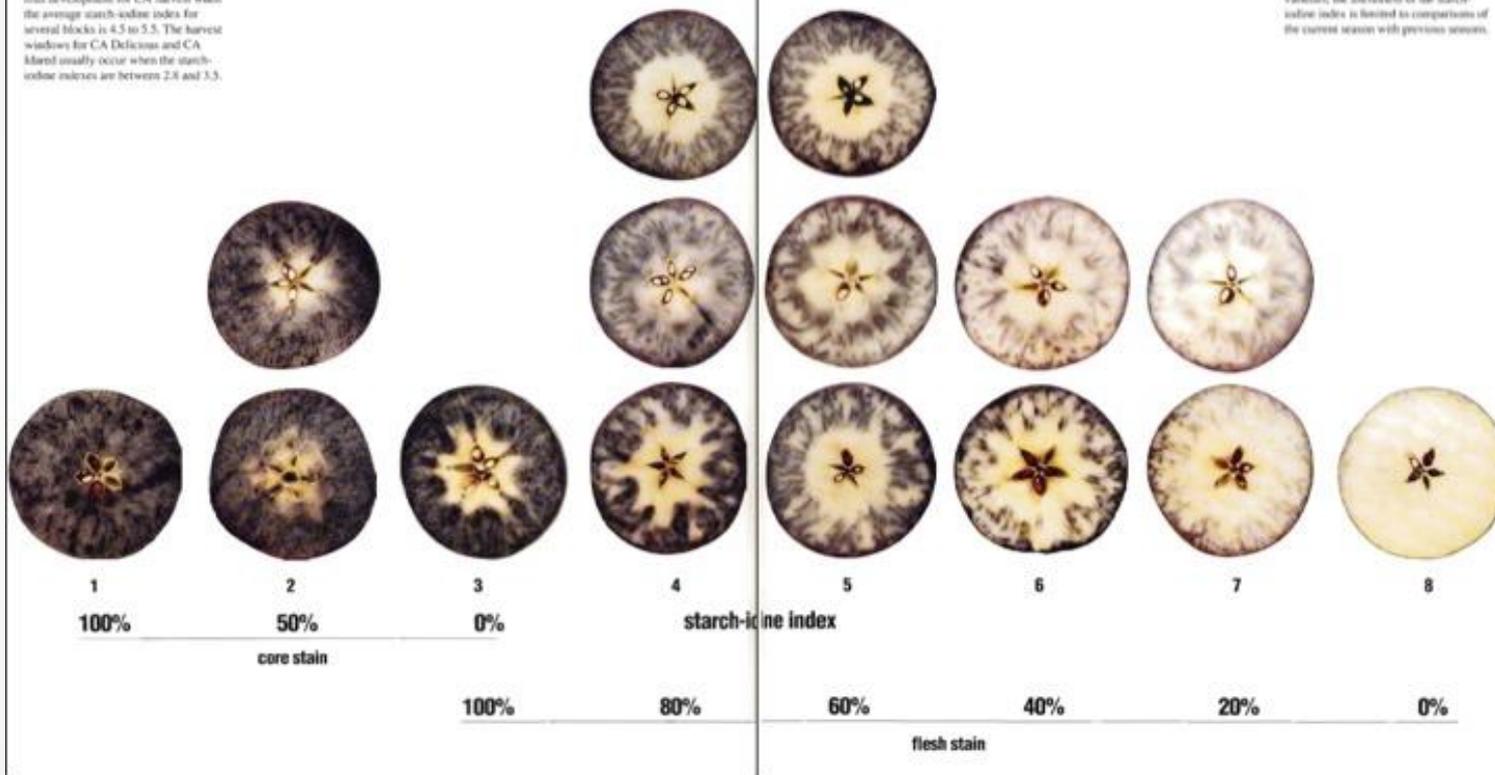
- Lab Analysis
- Sensory Evaluation



Cornell Starch-Iodine Index

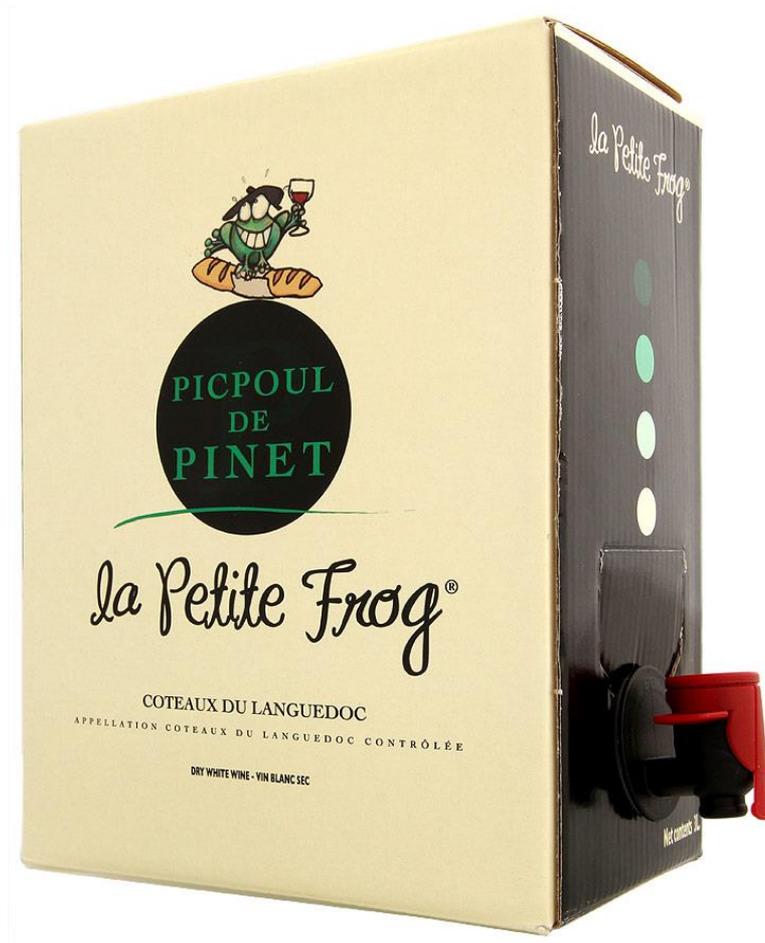
McIntosh should be picked for CA storage as the average starch staining in flesh tissue changes from 60 and 40 percent; i.e., at starch iodine index 5 and 6. Engage are usually at the best stage of fruit development for CA harvest when the average starch-iodine index for several blocks is 4.5 to 5.5. The harvest windows for CA Delicious and CA Mared usually occur when the starch-iodine indexes are between 2.8 and 3.5.

Starch iodine indexes for the harvest windows of other varieties have not yet been determined. If you do not have these four varieties to estimate the harvest windows for intervening varieties, the usefulness of the starch-iodine index is limited to comparisons of the current season with previous seasons.



Blanpied, G.D. and S.J. Silsby. 1992, Predicting Harvest Date Windows for Apples. Cornell Cooperative Extension. Informational Bulletin 221.





15 Brix Standard

Refractometer standard for use in hand held refractometers

CODE	QTY	WEIGHT	PRICE	
10-217-0946 <i>Available</i>	- <input type="text" value="1"/> +	1000 mL	\$18.00	SHOP NOW
10-217-0473 <i>Available</i>	- <input type="text" value="1"/> +	500 mL	\$14.00	SHOP NOW
10-217-0237 <i>Available</i>	- <input type="text" value="1"/> +	250 mL	\$10.00	SHOP NOW
10-217-0118 <i>Available</i>	- <input type="text" value="1"/> +	125 mL	\$8.00	SHOP NOW
10-217-0060 <i>Available</i>	- <input type="text" value="1"/> +	60 mL dropper bottle	\$7.00	SHOP NOW

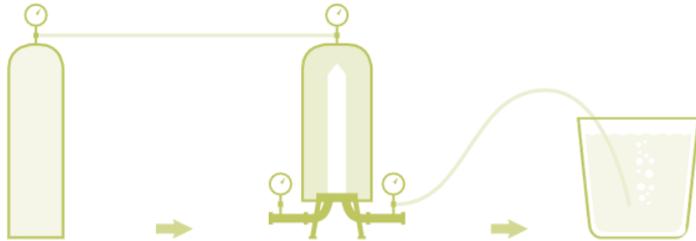
[» Safety Data Sheet](#)

ATP Swabs



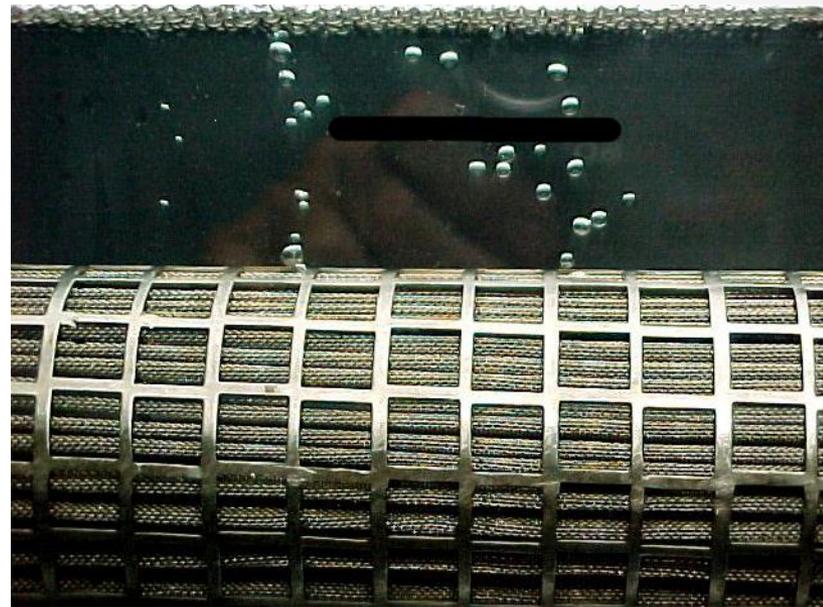
TEST

BUBBLE POINT INTEGRITY

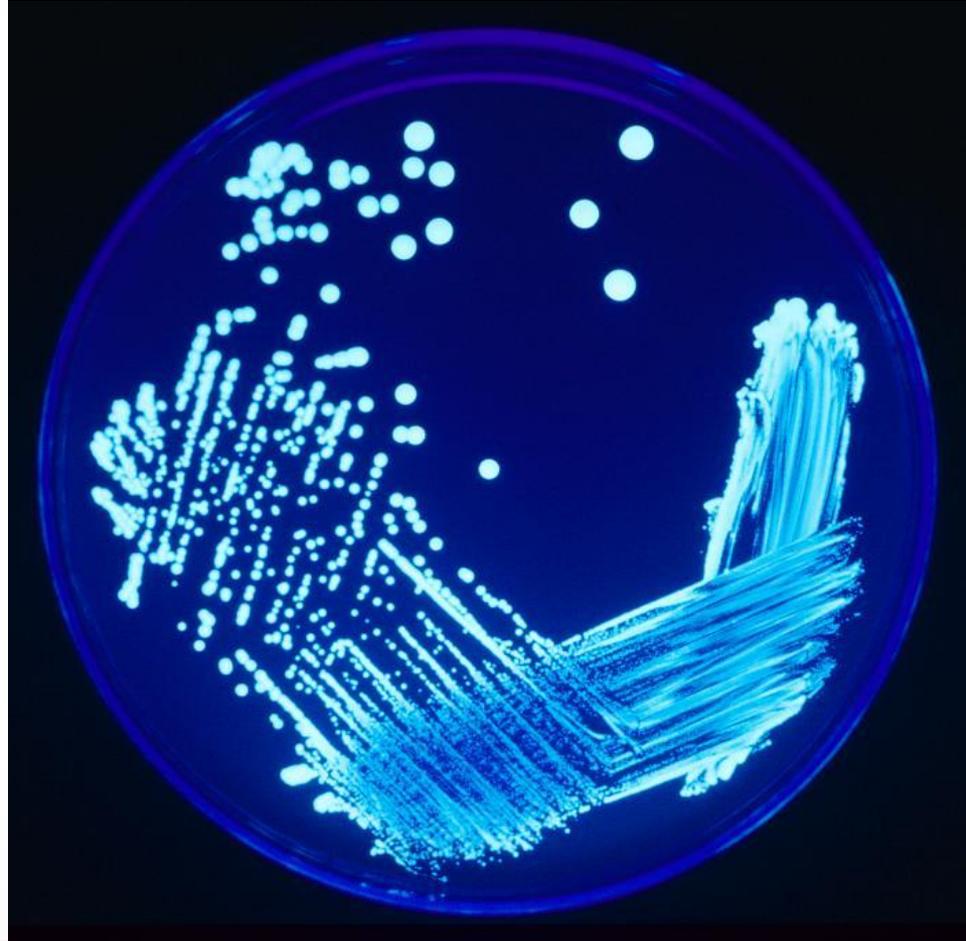


TEST METHOD

1. Sanitize filter.
2. Drain housing.
3. Connect the upstream port of the filter to compressed air (use a regulator).
4. Connect flexible hose from the downstream port of the filter into a bucket of water.
5. Gradually increase the pressure from zero, using the pressure regulator.
6. Observe the bucket of water for vigorous bubbling.
7. The bubble point is reached when bubbles are produced from the hose at a steady rate.



Package Sterility





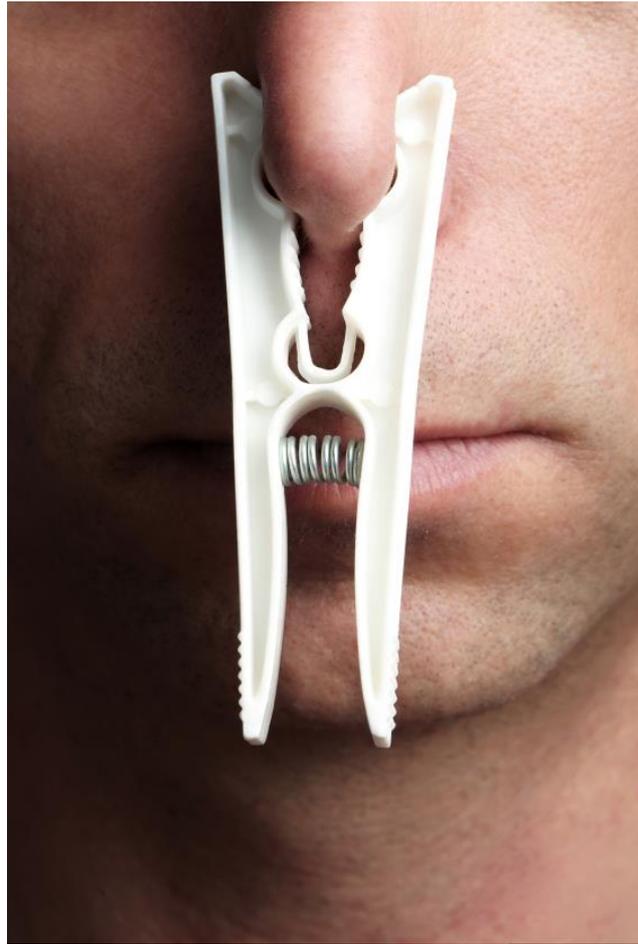
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Flaw Detection

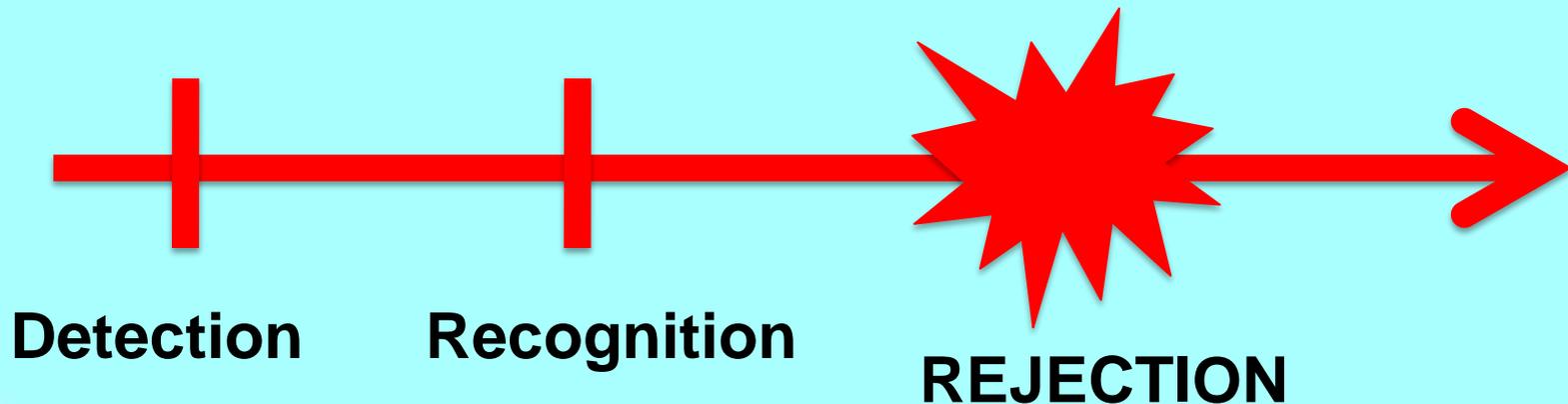


Flaw Detection, cont.



Flaw, or just complexity?

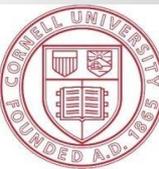
Increasing concentration of volatile X



- Standards hard to produce
- Flaws rarely occur singly
- Get training if possible...

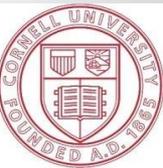
Sensory Evaluation

- Evaluation
 - Differentiation or ranking
 - Trained or untrained panelists
- Answers questions like:
 - Is the 2008 different from the 2009?
 - How much should we back-sweeten?
 - Would consumers buy this?



Basics of Sensory Science

- Experts: Description
- Consumers: Liking



Sensory Evaluation in the Cidery

- Goals:
 - Monitor winemaking progress
 - Screen for flaws
- Perception is personal
 - Thresholds
 - Specific anosmias
 - Learned response
 - “Cellar palate”
 - Personal preference vs. quality



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In-house sensory panel



- Expands sensitivity
- Reduces bias
- Gives closer approximation of population preferences

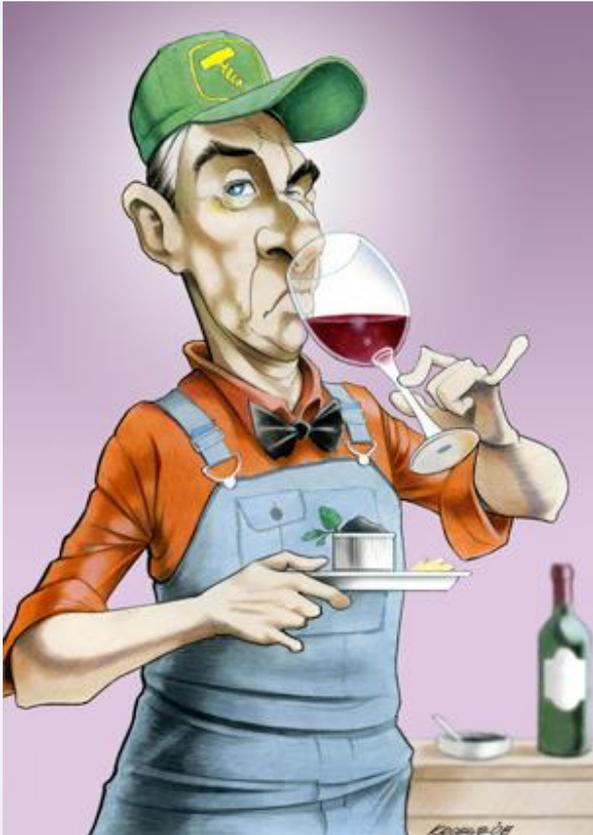
Note: Panel members probably DO NOT represent the average consumer's tastes!

Panel participants

- MOTIVATION
 - Feedback on performance
 - Educational sessions
 - Rewards (monetary, wine, etc.)
- Interest
- Age
- Gender
- Experience

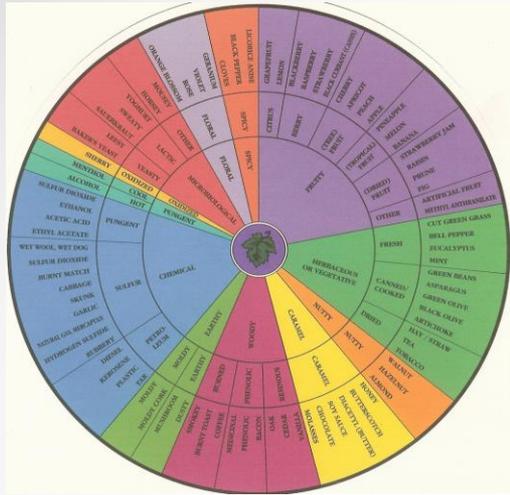


Characteristics of a good panelist

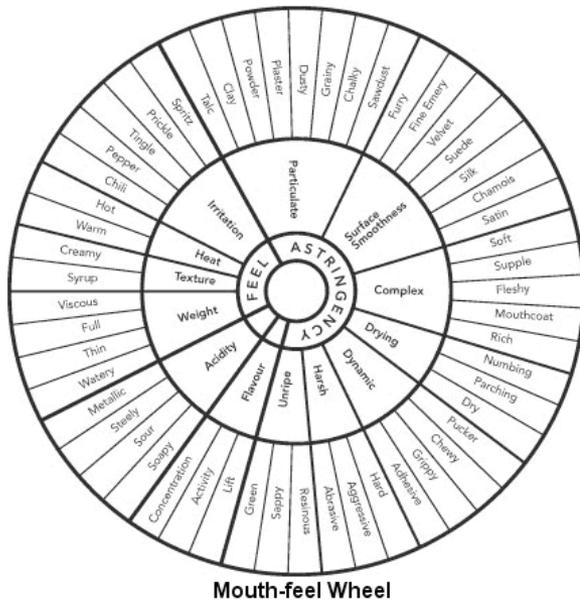


- Reproducible
- Discriminatory
- No anosmia, ageusia
- Can describe ciders fully and accurately
- *Consumer*
- *...not too knowledgeable*

Panelist training



- Aroma Wheel standards (*Noble et al., 1987*)
- 'Smell diary'
- Standard scales for sweetness, acidity
- Varietal wines from winery, region, or world
- Wine Flaws?



Mouth-feel Wheel

Sensory Environment



- Quiet
- Good lighting
- White background
- Free from odors-
 - Perfume/cologne
 - Smoking
 - Strong cooking odors
- Free from distractions

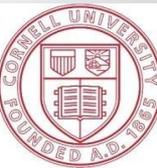
Sample

- Approx. 1-1.5 oz (30mL)
 - Pour volume should be the same to compare wines
- **Ambient temperature**
- **Start with ‘warm-up’ product**
- **Blind pour**



Supplies

- Clean, odor-free, matching glasses
 - ISO tasting glasses
- Adequate water (odor free)
- Spit cup/dump buckets
- Napkins
- Writing utensils and appropriate scoresheets



Test procedures



- Silent, individual assessments
- Require expectoration
- Rest at least 30 seconds between each wine
- Rinse and expectorate water between samples
- Palate cleanser?

Evaluation of finished ciders

- **Is 2014 as good as 2015?**
- Subjective rating of quality
- Trained panel
- **Wines served in random order**
- Numeric scoring
 - 20 or 100 pt scale

Assessment of processing methods

- **How much sugar should be added?**
- Ranked preference test
- Trained panel (specific parameter)
- **Identical** pour order
 - Lowest to highest
- Panelists rate levels by preference

Parameter Testing: Ranking

Write “1” in the box of the sample with the sweetness level that you prefer, “2” in the next, “3” for the next, and so on, with “6” for the sample you least prefer. Ties are not allowed.

629 137 937 730 385 247

Color influences aroma perception...



- Honey
- Lemon
- Grapefruit
- Straw
- Banana
- Lychee
- Petroleum
- Acacia

Morrot et al, Brain and Language 79 (2001)

Color influences aroma perception...



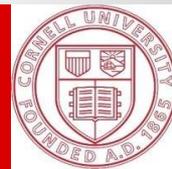
922058 [RF] © www.visualphotos.com

- Chicory
- Coal
- Peony
- Prune
- Blueberry
- Raspberry
- Clove
- Cherry
- Strawberry

Morrot et al, Brain and Language 79 (2001)

Assessment of processing methods

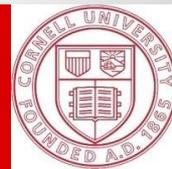
- **Which blend is best?**
- **Ranked preference test**
- **Trained**
 - **Familiarity with parameter tested**
- **Randomized**
- **Panelists indicate preference**



Consumer Acceptance

- **Would you buy this product?**
- Hedonic or acceptance test
- **Untrained panel-** consumers
- Acceptance scale

- **Caveats:**
 - Large number of responses needed (50-100)
 - Environment hard to control



Useful Tests: Liking or Hedonic

- How much do you like this wine?
- Hedonic scale- Odd number of options
- Consumer panels

- Like extremely
- Like very much
- Like moderately
- Like slightly
- Neither like nor dislike
- Dislike slightly
- Dislike moderately
- Dislike very much
- Dislike extremely

Useful tests: Difference?

- Triangle tests
 - Two ciders same, one different
 - Select the odd sample



- Paired Comparison Tests
 - Two different samples
 - Which sample is more _____?

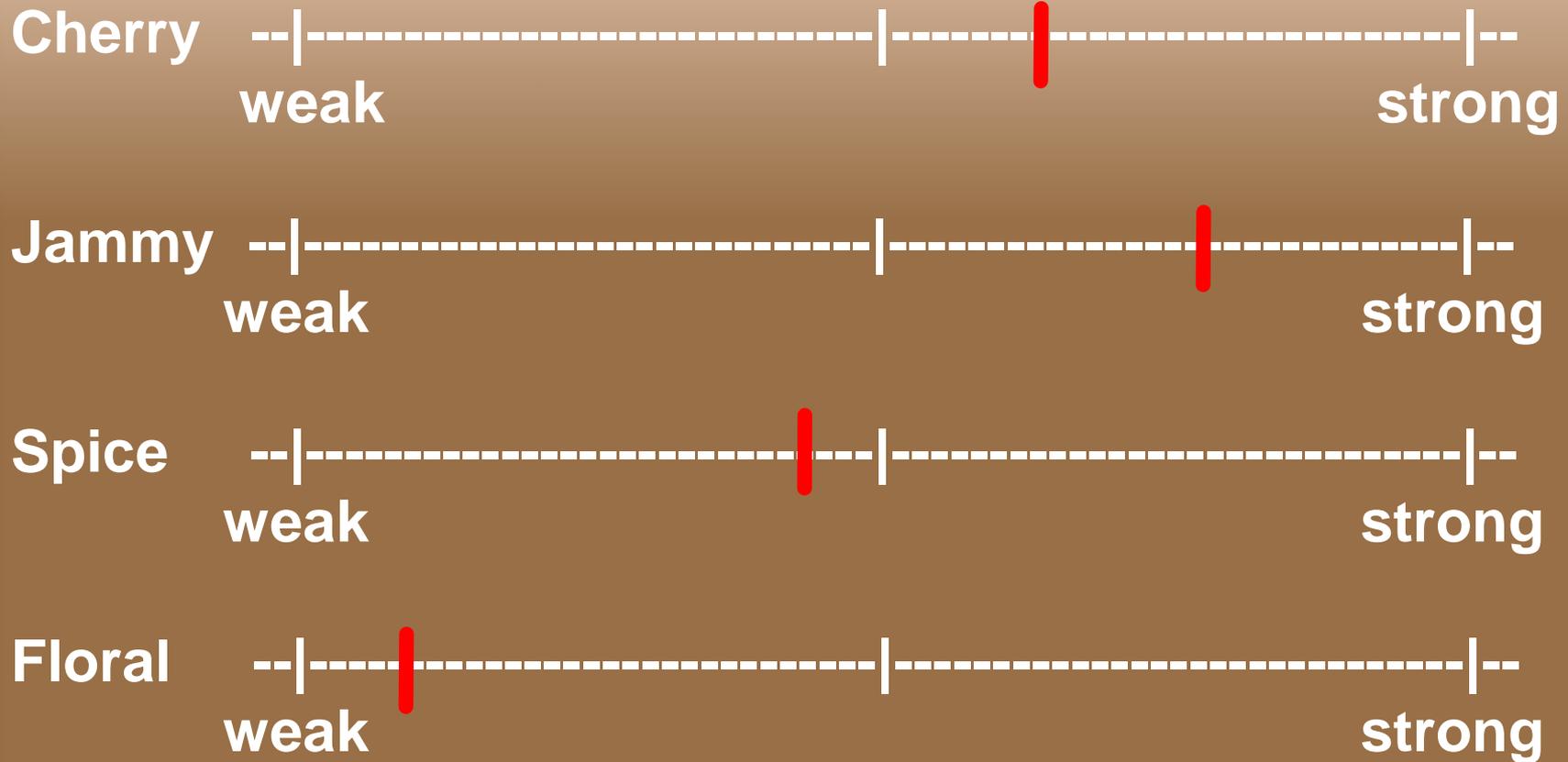
Descriptive Analysis

- Detection and description of sensory attributes
 - Descriptor set
 - Attribute standards
 - Intensity ratings



Line-Scale Ranking

Sample 053:



Carbonated Soft Drink Ratings

	Too Low (%)	Just Right (%)	Too high (%)
Sweetness	30	55	15
Citrus flavor	50	40	10
Carbonation	22	65	13

The Trouble with Competitions

- Judge qualification/screening
- Qualitative or Hedonic measurement
- Data averaged or forced consensus
 - Point system



A better way to think about it...

- Competitions aren't 'scientific' evaluations
- Objectives:
 - Feedback from broader range of tasters
 - Publicity/promotion
- Helpful hints:
 - Flaws WILL be noticed
 - Color/aroma correlation
 - A hint of sweetness...



Tasting Group



Tasting Group



Take home message(s):



- Ask the right questions
- Figure out how to answer the question
- Get lots of honest input
- The customer is always right