

A Matter of Taste: Sensory Evaluation in the Winery

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What is sensory science?

A scientific discipline used to
evoke, measure, analyze,
and interpret reactions to
products as perceived by the
senses of sight, smell, taste,
touch and hearing.

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Sensory Evaluation of Wine

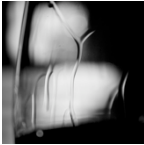

- Sight
- Smell
- Taste
- Touch
- Hearing


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Sight: Visual Inspection


- Clarity
 - Particulate matter
 - Hazes
- Color
 - White background
 - Varies by wine type, style
- Legs?



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Smell


- Humans can smell thousands of things...
 - Orthonasal vs. retronasal
 - Anosmias
 - Aroma mixtures
- Describing aromas
 - Difficult!
 - Terminology

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Aroma vs. Bouquet

Odors originating from the grape
vs.
Odors arising from processing



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Tasting (Palate)

- Taste bud distribution

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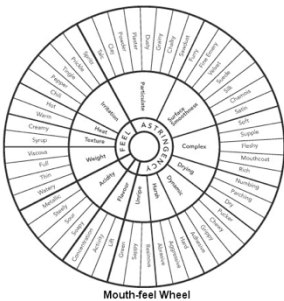
Tasting (Palate)

- Take a sip- just enough to coat tongue
 - Move all around your tongue & mouth
 - Saliva and heat will release volatiles
- Assess retronasal aromas
 - Tilt head forward to open back of throat
 - Exhale

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Palate: Tactile



Mouth-feel Wheel


- Mouthfeel
- Weight/viscosity
- Texture
- Astringency
 - Tannins
 - Protein precipitation


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Trigeminal Sensations


- Ethanol
 - Burning
 - Prickling sensation
 - Sensation of heat
- Carbon dioxide
 - Fizz
 - Prickling sensation



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Sensory Evaluation in the Winery


- Goals:
 - Monitor winemaking progress
 - Screen for flaws
- Perception is personal
 - Threshold
 - Specific anosmia
 - "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!

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Characteristics of a good panelist

- Reproducible
- Discriminatory
- No anosmia, ageusia
- Can describe wines fully and accurately
- *Wine consumer*
- *...not too knowledgeable*

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Recruiting panel members

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

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Recruiting panel members

- **Panel Size**
 - Ideal: 8-12 dependable panelists
 - Assemble panel of about 12-15
 - Attrition
 - Poor panelists who have to be retained

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Panelist training

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

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Sensory Environment

- Quiet
- Good lighting
- White background
- Free from odors-
 - Perfume/cologne
 - Smoking
 - Strong cooking odors
- Free from distractions
 - Tasting right after a meal or when hungry



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Sample

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



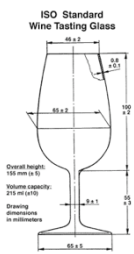
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Supplies

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

Glassware



- Matching glasses
- Shape
 - ISO
 - Rim diameter should be smaller than widest part of bowl to focus aromas

Test procedures

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

Palate cleansers

- Water, crackers, etc.
- Primarily a "brain refresher"
- Residues may affect intensity perception
- None effective for tannin buildup



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Wine "Balance"



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Useful tests for winery panels

- Evaluation of finished wines
 - Is 2009 like 2010?
- Assessment of processing methods
 - How much fining agent should we use?
- Consumer acceptance of finished wine

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Evaluation of finished wines

- Is 2006 as good as 2005?
- Subjective rating of quality
- Trained panel
- Wines served in random order
- Numeric scoring
 - 20 or 100 pt scale

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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

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Parameter testing: Ranking

Write "1" in the box of the sample with sweetness level that you prefer, "2" in the next, "3" for the next, and so on, with "6" for the sample you least prefer.


629 137 937 730 385 247


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Assessment of processing methods

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



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Consumer acceptance




- Would you buy this wine?
- Hedonic or acceptance test
- Untrained panel- consumers
- Acceptance scale
- Caveats:
 - Larger number of responses needed
 - Environment hard to control

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Liking or Hedonic Tests

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

<input type="checkbox"/> Like extremely
<input type="checkbox"/> Like very much
<input type="checkbox"/> Like moderately
<input checked="" type="checkbox"/> Like slightly
<input type="checkbox"/> Neither like nor dislike
<input type="checkbox"/> Dislike slightly
<input type="checkbox"/> Dislike moderately
<input type="checkbox"/> Dislike very much
<input type="checkbox"/> Dislike extremely

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Wine Competition Judging



- **Publicity and marketing = primary goal**
- **Qualitative or Hedonic measurement**
- **No qualifying tests**
- **Often non-reproducible**
- **Data averaged or forced consensus**
- **Point system**

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Wine Sales

- **Trade tastings, tasting rooms, etc.**
- **Few sensory principles followed**
- **Taster judgment influenced by several other factors**



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Tests to avoid



- **Difference testing**
- **Descriptive analysis**

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Points to remember:

- Learn your blind spots- if you know your thresholds and specific anosmia(s), you can work around them.
- Learn different flaws at different concentrations.
- Develop a standing sensory panel if possible, and train them.



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