Identifying Wine Sensory Attributes

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Physiology of Sensory
Human Senses

- Vision
- Touch
- Olfaction
- Trigeminal factors
- Taste
- Hearing
Vision and Sensory Perception

Perception of product appearance

- Influenced by color or appearance of background
- Impacted by gloss or texture of a surface
- Can vary among subjects with sensitivities to color differences
- Can be masked by changing the lighting where product is viewed
Olfaction and Sensory Perception

Volatile compounds sensed by olfactory epithelium in roof of nasal cavity

- Perceived when sniffing (aroma)
- Perceived when ingesting (aromatics)
- Best is short exposure of 1-2s with recovery time of 10-20s
Taste and Sensory Perception

- Taste perception mediated by taste receptor cells in taste buds
  - There are 9,000 taste buds on a tongue, but sensitivity not just related to number of buds.
  - Taste receptors are mostly on the tongue, but some on palate and throat.

- Perception of basic tastes
  - Salt, sour, bitter, sweet, and umami
Science of Taste

Taste is genetically controlled by two genes that control the number of taste buds people have on their tongues.

- Hypo Tasters
- Normal Tasters
- Hyper Tasters

![Individual Differences in Taste Bud Density](Source: www.bbc.co.uk/science)
Hypo Tasters

- Have two recessive genes and no hypertaster genes
- Non-taster is taste blind to many basic tastes
  - May not mind tannins
  - Less sensitive to sweetness of off-dry wines
  - Find little bitterness in heavy alcoholic drinks
  - Prefer spicy foods
  - Prone to finding sweet wines more acceptable
- One-quarter of all people fall into the category of “taste blindness”
- 96 taste buds/cm²
Normal Tasters

- Have one dominate hypertaste genes and one recessive gene
- Experiences basic tastes in a moderate manner
  - Experience foods as not to sweet, salty, sour, or bitter
  - Choose middle-of-the-road flavors
  - Sugars more palatable, heavy alcohol less bitter and tannins less biting than hyper tasters
- Half of all people in this category
- 184 taste buds/cm²
Hyper Tasters

- Have two “dominate” genes that allow individuals to experience a high intensity of basic tastes
- Super tasters are hyper-sensitive to basic tastes
  - Sugary foods are sickeningly sweet
  - Coffee can be too bitter
  - Alcohol too sharp
  - Hot peppers and ginger produce an unpleasant burn
  - Pungent foods are liked
- One-quarter of all people are hypertasters (large percentage of women and Asians)
- 425 taste buds/cm²
What Kind of Taster are You?

- Hypo Tasters?
- Normal Tasters?
- Hyper Tasters?

[Click here for Taster PROP video]
Using the Wine Aroma Wheel
Developed in 1980 by Professor Ann Noble

Designed to enhance the accuracy of communication about wine odors among members of the wine industry

## Wine Aroma Terminology

<table>
<thead>
<tr>
<th>1st Tier</th>
<th>2nd Tier</th>
<th>3rd Tier</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Floral</td>
<td>Floral</td>
<td>Linalool</td>
</tr>
<tr>
<td>2. Spicy</td>
<td>Spicy</td>
<td>Cloves</td>
</tr>
<tr>
<td>3. Fruity</td>
<td>Other</td>
<td>Methyl anthranilate</td>
</tr>
<tr>
<td>4. Herbaceous/vegetative</td>
<td>Fresh</td>
<td>Mint</td>
</tr>
<tr>
<td>5. Herbaceous/vegetative</td>
<td>Cooked</td>
<td>Green Beans</td>
</tr>
<tr>
<td>6. Nutty</td>
<td>Nutty</td>
<td>Almond</td>
</tr>
<tr>
<td>7. Caramelized</td>
<td>Carmel</td>
<td>Diacetyl</td>
</tr>
<tr>
<td>8. Wood</td>
<td>Resinous</td>
<td>Oak</td>
</tr>
<tr>
<td>9. Earthy</td>
<td>Earthy</td>
<td>Mushroom</td>
</tr>
</tbody>
</table>
# Wine Aroma Terminology

| 1st Tier          | 2nd Tier    | 3rd Tier                        |
|-------------------|-------------|---------------------------------
| 10. Chemical      | Sulfur      | Hydrogen Sulfide                |
| 11. Chemical      | Sulfur      | Sulfur dioxide                 |
| 12. Chemical      | Pungent     | Ethyl acetate                   |
| 13. Pungent       | Hot         | Alcohol                         |
| 14. Oxidized      | Oxidized    | Acetaldehyde                    |
| 15. Microbiological| Yeasty     | Flor-Yeast                      |
| 16. Microbiological| Lactic     | Butyric acid                    |
Sensory of Wine
**Wine Judging Sheet**

**SIGHT**
- **Clarity**: cloudy, dull, clear, brilliant
- **Depth of Color**: watery, pale, medium, deep, dark
- **Color** (reds): purple, purple/red, red, re/brown
  (Whites): green tinge, pale yellow, yellow, gold, brown
- **Viscosity**: slight sparkle, watery, normal, heavy, oily

**SMELL**
- **General Appeal**: neutral, clean, attractive, outstanding, off
- **Fruit Aroma**: non, slight, positive, identifiable
- **Bouquet**: none, pleasant, complex, powerful

**TASTE**
- **Sweetness** (whites): bone dry, dry, semi-dry-semisweet, sweet
- **Tannin** (reds): astringent, hard, dry, soft
- **Acidity**: flat, refreshing, marked, tart
- **Body**: very light and thin, light, medium, full bodied, heavy
- **Length**: short, acceptable, extended, lingering
- **Balance**: unbalanced, good, balanced, perfect

**OVERALL**
- **Coarse, poor, acceptable, fine, outstanding**
Overall Wine Tasting

- Sight
- Smell
- Taste
Sight of the Wine

- Observe wine as it is poured into the glass
- Observe wine in glass against a white background
- Evaluate clarity, depth of color, color and viscosity
Wine Clarity

Clarity ranges from cloudy, dull, clear, and brilliant
### Color and Depth of Color

<table>
<thead>
<tr>
<th>WHITE WINE</th>
<th>RED WINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pale yellow-green</td>
<td>Purple</td>
</tr>
<tr>
<td>Straw yellow</td>
<td>Ruby</td>
</tr>
<tr>
<td>Yellow-gold</td>
<td>Red</td>
</tr>
<tr>
<td>Gold</td>
<td>Brick red</td>
</tr>
<tr>
<td>Old gold</td>
<td>Red-brown</td>
</tr>
<tr>
<td>Yellow-brown</td>
<td>Brown</td>
</tr>
<tr>
<td>Maderized</td>
<td>Brown</td>
</tr>
</tbody>
</table>

- **Depth of Color** - watery, pale, medium, deep, dark
- **Red wine color** - purple, purple/red, red, re/brown
- **White wine color** - green tinge, pale yellow, yellow, gold, brown
Red Wine Color

Grape skins give color to the wine during fermentation. The depth of color is influenced by grape variety, fruit maturity, climate, minerals in the soil, vinification technique and aging.

<table>
<thead>
<tr>
<th>Color</th>
<th>Purple‘ish red</th>
<th>Cherry red</th>
<th>Brown‘ish red</th>
<th>Orange‘ish red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1-2 years</td>
<td>3-5 years</td>
<td>7-10 years</td>
<td>10+ years</td>
</tr>
</tbody>
</table>
Smell or “nose” of the Wine
Wine Smells

- Evaluate positive attributes of wine
  - general appeal, fruit aroma, and bouquet
- Identify undesirable odors foreign to a sound wine
  - microbiological, oxidized, pungent, chemical, and earthy
Wine Smells

- **Off**
  - Smells that are undesirable

- **Aroma**
  - Smells associated with grapes

- **Bouquet**
  - Smells originating during winemaking
Off Smells (Odors)
Undesirable odors foreign to smell of sound wine

- Include microbiological, oxidized, pungent, chemical, and earthy segments of aroma wheel
  - Butyric acid- “sauerkraut”
  - Acetaldehyde- “flat, sherry-like”
  - Alcohol- “fusel odor”
  - Ethyl acetate-“sour, vinegary”
  - Sulfur dioxide-“burnt match”
  - Hydrogen sulfide-“rotten egg”
  - Moldy-“cork taint” produced by 2, 4, 6-trichloroanisole (TCA) by fungal growth on/in cork

Click here for cork taint video
Aroma

Pleasant and desirable odors from the grape

- Varietal aroma
  - Characterization of particular grape varieties grown under proper conditions and made carefully into wine

- Distinct
  - Individual in character but not intense enough to permit varietal identification

- Vinous
  - Description when no varietal or distinct aroma is detectable
Bouquet are odors added to wines as they are made

- Fermentation
- Bottle
- Oak-aging
- Champagne
## Characteristic Wine Aromas

<table>
<thead>
<tr>
<th>Variety</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chardonnay</td>
<td>buttery</td>
</tr>
<tr>
<td>Johannisberg Riesling</td>
<td>floral</td>
</tr>
<tr>
<td>Gewuztraminer</td>
<td>spicy</td>
</tr>
<tr>
<td>Sauvignon blanc</td>
<td>grassy</td>
</tr>
<tr>
<td>Cabernet Sauvignon</td>
<td>bell pepper</td>
</tr>
<tr>
<td>Pinot noir</td>
<td>coffee</td>
</tr>
<tr>
<td>Gamay</td>
<td>cherry</td>
</tr>
</tbody>
</table>
Taste of Wine
Evaluation of Wine by Taste

- Separate tastes of wine present sequentially
  - Sweetness
  - Acidity
  - Tannins
  - Body
  - Flavor
Typical Flavors in Wines

- **Cabernet Sauvignon**
  - Aroma and taste of fresh, ripe black currants
  - Has cedary flavors with vanilla, cinnamon and cloves when aged in oak
- **Chardonnay**
  - Taste of white currants
  - Has buttery, toasted flavors with vanilla and spices when aged in oak
- **Merlot**
  - Has a slight sweetness, an up-front fruitiness with almost a chocolatey edge and a soft, silky texture
- **Red Zinfandel**
  - Has dark cherry, plum, and spicy flavors
Wine Aroma and Taste Impacted by Temperature

- **Sparkling wines & sweet white wines**: 40-45°F
- **Dry white & rose table wines**: 50-60°F
- **Light-bodied red table wines**: 50-65°F
- **Red table wines**: 65-68°F
Simple Wine Sensory

- Gross
- Elegant
- Drinkable
What separates wine judges from the rest of us? It is their ability to break down flavors in the glass.