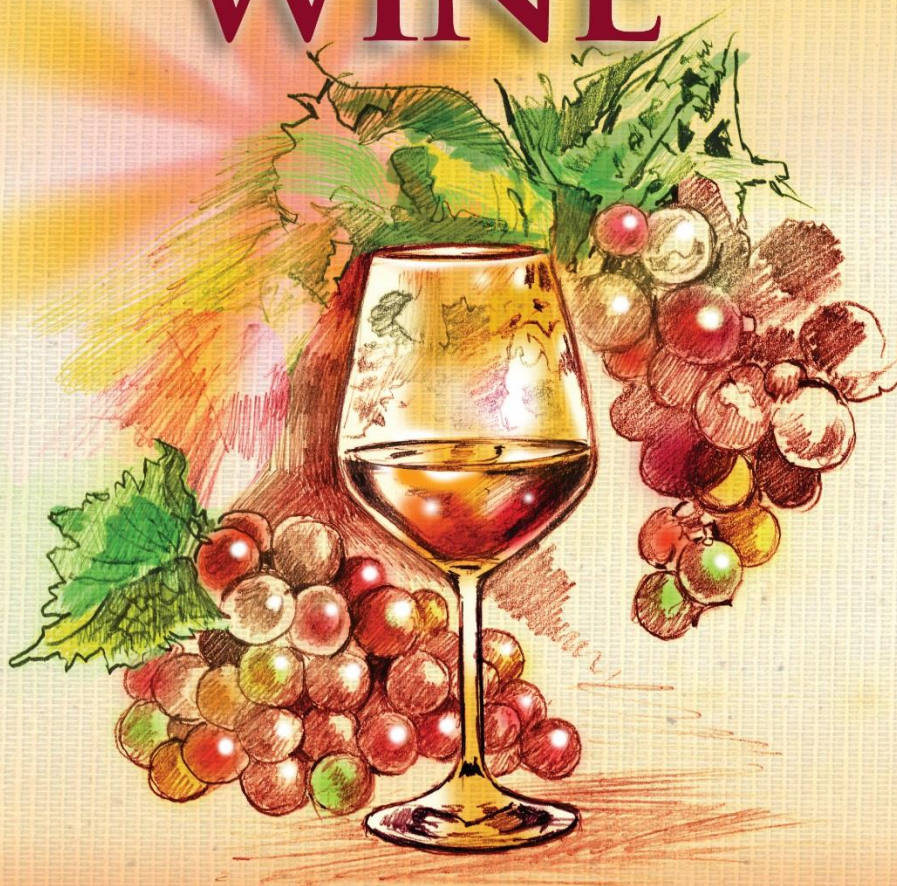


HERDS & HARVEST

Sensory Analysis of
WINE



University of Nevada
Cooperative Extension



College of Agriculture, Biotechnology
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University of Nevada, Reno

Reno, Nevada

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TABLE OF CONTENTS

SENSORY ANALYSIS	1
FOUR KEY PLAYERS IN WINE TASTING	2
FLAVOR IN WINE.....	3
YOUR SENSE OF SMELL	4
SETTING	5
WHERE DO WINE FLAVORS COME FROM	6
RANKING SHEET	7
WINE SCORE SHEET	9
AROMA WHEEL CHART	10
APPENDIX	11
RESOURCES.....	13

Sensory Analysis

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Learning Objectives

- What is sensory analysis
- How your body perceives smell and taste
- The flavors in wine
- Training your pallet

What is sensory analysis?

- Sensory analysis is the process of identifying and describing flavor and aroma compounds in food or wine
- Both the nature and intensity of the flavors are important
- Typically performed by trained panels of judges
- Sensory science is not "if you like it"

Four key players in wine tasting

- Flavor
- Aroma
- Sight
- Setting

Flavor

- Perceived by the tongue
- 5 basic flavors can be tasted
 - Sweet
 - Sour
 - Bitter
 - Salty
 - Savory
- All other "flavors" are the product of another sense

The tongue

- Over 9000 taste buds on your tongue
- Location and size of taste buds doesn't matter
 - Each one tastes every flavor equally
- Small nerve endings sense concentrations of flavor molecules in your food
- All flavors are water soluble

Flavor in wine

- A combination of sweet, sour, and bitter
- Everyone has different sensitivities and preferences for flavors
- Flavor is a product of grape chemistry and microbial activity

What influences wine flavor

- Cool climate increases acidity
- Hot climate and high light intensity increase bitterness
- All wine naturally ferments to dryness, sugar is usually added back

Aroma

- Aroma molecules are small aromatic chemicals that bind to sensory hairs in your nose
- Aromas can be smell nasally (outside the mouth) or retro-nasally (from inside the mouth)
- More than 75% of the perceived flavor of a food is aroma

Your sense of smell

- Over 1000 times more sensitive than taste
- The oldest and most primal of the senses
 - Aromas easily form and trigger memories
- Fast to adapt
 - Nose adapts to aromas in less than 2 minutes
- Must be trained
- Easy to lose



Aroma in Wine

- There are thousands of aroma chemicals in wine
 - Around 60 are important
- Complex combinations of aromas make it difficult to single out specific ones
- Aromas come from the grapes, microbes, and additives

Sight

- How something looks is an important part of how it tastes
- People expect more flavor out of darker wines
- Black glasses are used to remove bias



Setting

- The setting in which you drink has a large impact on overall preference
- Preference and flavor are subjective
- The same glass of wine can taste totally different depending on your mood, who your with, and where you are
- Problem for small wineries and European producers

Setting makes all the difference



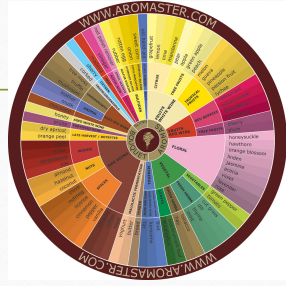
Wine flavors

- Flavor - Sweet, sour, bitter
- Good Aroma - Fruity, nutty, woody, floral
- Bad Aroma - Microbial taints

Where do wine flavors come from?

Aroma is from the grapes

Bouquet/fauls are from how the wine was fermented or handled



Train your pallet

- You must learn to differentiate between the different flavors and aromas through practice
- Continued exposure and mindful drinking

Rank the following by perceived intensity
(1 = lowest intensity, 3 = highest intensity)

Flavor	ID		
Acidity	713	909	681
<hr/>			
Bitter	215	168	898
<hr/>			
Sweet	465	999	961
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Mystery	345	360	699
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Aroma	
Nail polish remover	
Bread	
Eucalyptus	
Blackberry	
Guava	
Gooseberry	
Tobacco	
Rose	
Strawberry	
Apple	
Passion fruit	
Barnyard	
Blackcurrant	
Lavender	
Banana	
Oak	
Corked	
Butter	
Chocolate	
Lemon	
Cherry	
Melon	
Capsicum	
Mint	
Vanilla	
Honey	
Sherry	
Smoke	
Coconut	
Vinegar	

Wine Score Sheet

Wine	Acidity	Bitterness	Sweetness	Color	Aroma
1					
2					
3					

Appendix 5.3 Basic off-odor samples^{abcd}

Sample	Amount (per 300 ml neutral-flavored base wine)
Corked	
2,4,6-TCA	3 µg 2,4,6-trichloroanisole
Guaiacol	3 mg Guaiacol
Actinomycete	2 mg geosmin (an ethanolic extract from a <i>Streptomyces griseus</i> culture ^c)
Penicillium	2 mg 3-octanol (or an ethanolic extract from a <i>Hemigera (Penicillium)</i> culture ^f)
Chemical	
Fusel	120 mg Isoamyl and 300 mg isobutyl alcohol
Geranium-like	40 mg 2,4-Hexadienol
Buttery	12 mg Diacetyl ^g
Plastic	1.5 mg Styrene
Sulfur	
Sulfur dioxide	200 mg Potassium metabisulfite
Goût de lumière	4 mg Dimethyl sulfide ^g and 0.4 mg ethanethiol
Mercaptan	4 mg Ethanethiol
Hydrogen sulfide	2 ml Solution with 1.5 mg Na ₂ S·9H ₂ O
Miscellaneous	
Oxidized	120 mg Acetaldehyde
Baked	1.2 g Fructose added and baked 4 weeks at 55°C
Vinegary	3.5 g Acetic acid
Ethyl acetate	100 mg Ethyl acetate
Mousy	alcoholic extract culture of <i>Brettanomyces</i> (or 2 mg 2-acetyltetrahydropyridines)

Temperate tree fruit	
Apple	15 mg Hexyl acetate
Cherry	3 ml Cherry brandy essence (Noirot)
Peach	100 ml Juice from canned peaches
Apricot	2 Drops of undecanoic acid γ -lactone plus 100 ml juice from canned apricots
Tropical tree fruit	
Litchi	100 ml Litchi fruit drink (Leo's)
Banana	10 mg Isoamyl acetate
Guava	100 ml Guava fruit drink (Leo's)
Lemon	0.2 ml Lemon extract (Empress)
Vine fruit	
Blackberry	5 ml Blackberry essence (Noirot)
Raspberry	60 ml Raspberry liqueur
Blackcurrant	80 ml Blackcurrant nectar (Ribena)
Passion fruit	10 ml Ethanolic extract of one passion fruit
Melon	100 ml Melon liqueur
Floral	
Rose	6 mg Citronellol
Violet	1.5 mg β -Ionone
Orange blossom	20 mg Methyl anthranilate
Iris	0.2 mg Irone
Lily	7 mg Hydroxycitronellal
Vegetal	
Beet	25 ml Canned beet juice
Bell pepper	5 ml 10% Ethanolic extract from dried bell pepper (2 g)
Green bean	100 ml Canned green bean juice
Herbaceous	3 mg 1-Hexen-3-ol
Spice	
Anise/licorice	1.5 mg Anise oil
Peppermint	1 ml Peppermint extract (Empress)
Black pepper	2 g Whole black peppercorns
Cinnamon	15 mg <i>trans</i> -Cinnamaldehyde
Nuts ^b	
Almond	5 Drops bitter almond oil
Hazelnut	3 ml Hazelnut essence (Noirot)
Coconut	1.0 ml Coconut essence (Club House)
Woody	
Oak	3 g Oak chips (aged \geq 1 month)
Vanilla	24 mg Vanillin
Pine	7.5 mg Pine needle oil (1 drop)
Eucalyptus	9 mg Eucalyptus oil
Pyrogenous	
Incense	half a Stick of Chinese incense
Smoke	0.5 ml Hickory liquid smoke (Colgin)

Resources

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Ronald S. Jackson. (2011). **Wine Tasting: A Professional Handbook**

Blandy. (1997). **The University Wine Course: A Wine Appreciation Text & Self**

Tutorial

http://www.winepros.org/wine101/sensory_guide.htm

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