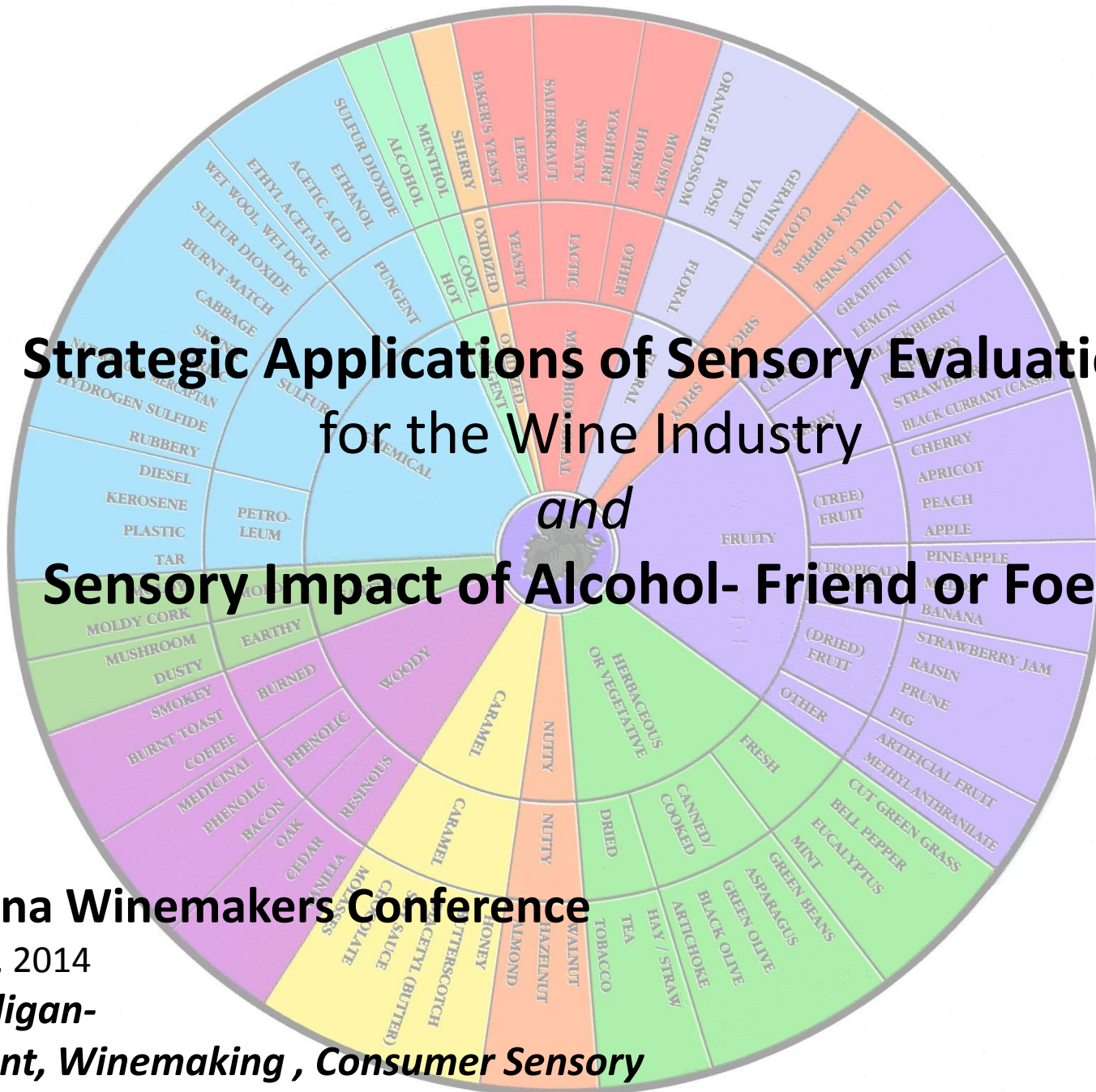
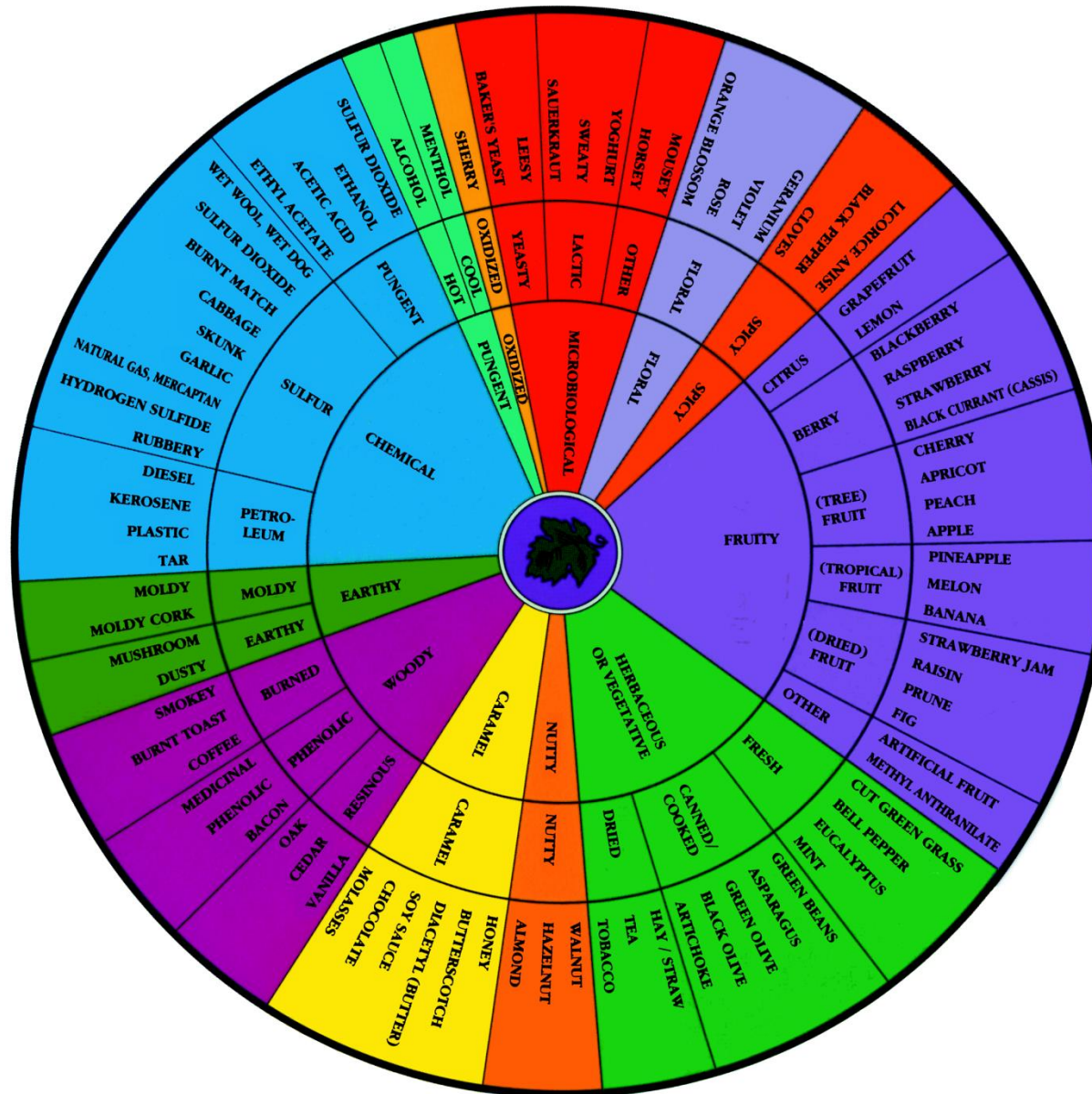


Strategic Applications of Sensory Evaluation for the Wine Industry *and* Sensory Impact of Alcohol- Friend or Foe?



Rosh Pina Winemakers Conference
 May 29th, 2014
Jane Milligan-
Consultant, Winemaking, Consumer Sensory

1990 Wine Aroma Wheel- Noble, UC Davis





What is Sensory Evaluation ?

A science that measures the responses of people to products using **sight, sound, smell, taste and texture.**

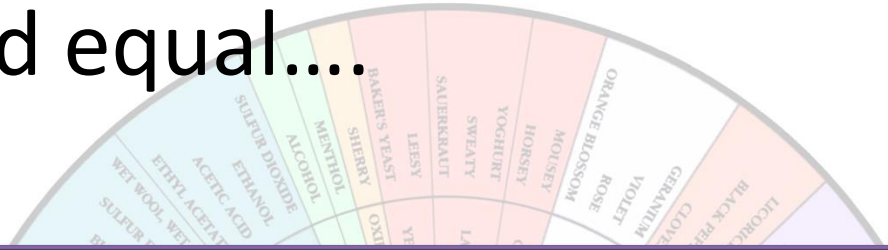


- In other words, it involves more than “taste”
- In fact, while the receptors are unique (vision, taste, odor), their stimulation yields **interactive effects.**

Think about a feast for the eyes.



We are not all created equal....



- Human sensitivities vary greatly
 - One third of us are bitterness blind....
 - Even winemakers have “blind spots”
 - So, N=1 blending is too risky
 - Start by coding, and randomizing samples.
 - And don't give away too much information....
-

Using formal sensory techniques

For every day winemaking decisions



- Code using two-digit numbers.....*NOT* ...A,B, C....F
 - Randomize, so *every* wine gets a fresh nose and taste buds
 - Use basic discrimination tests for:
 - ✓ Fining trials
 - ✓ Blend trials
 - ✓ Evaluating wine additions, acid series etc.
 - Recommend DUO-TRIO, NOT Triangle test
-

Evaluating YOU vs THE COMPETITION-

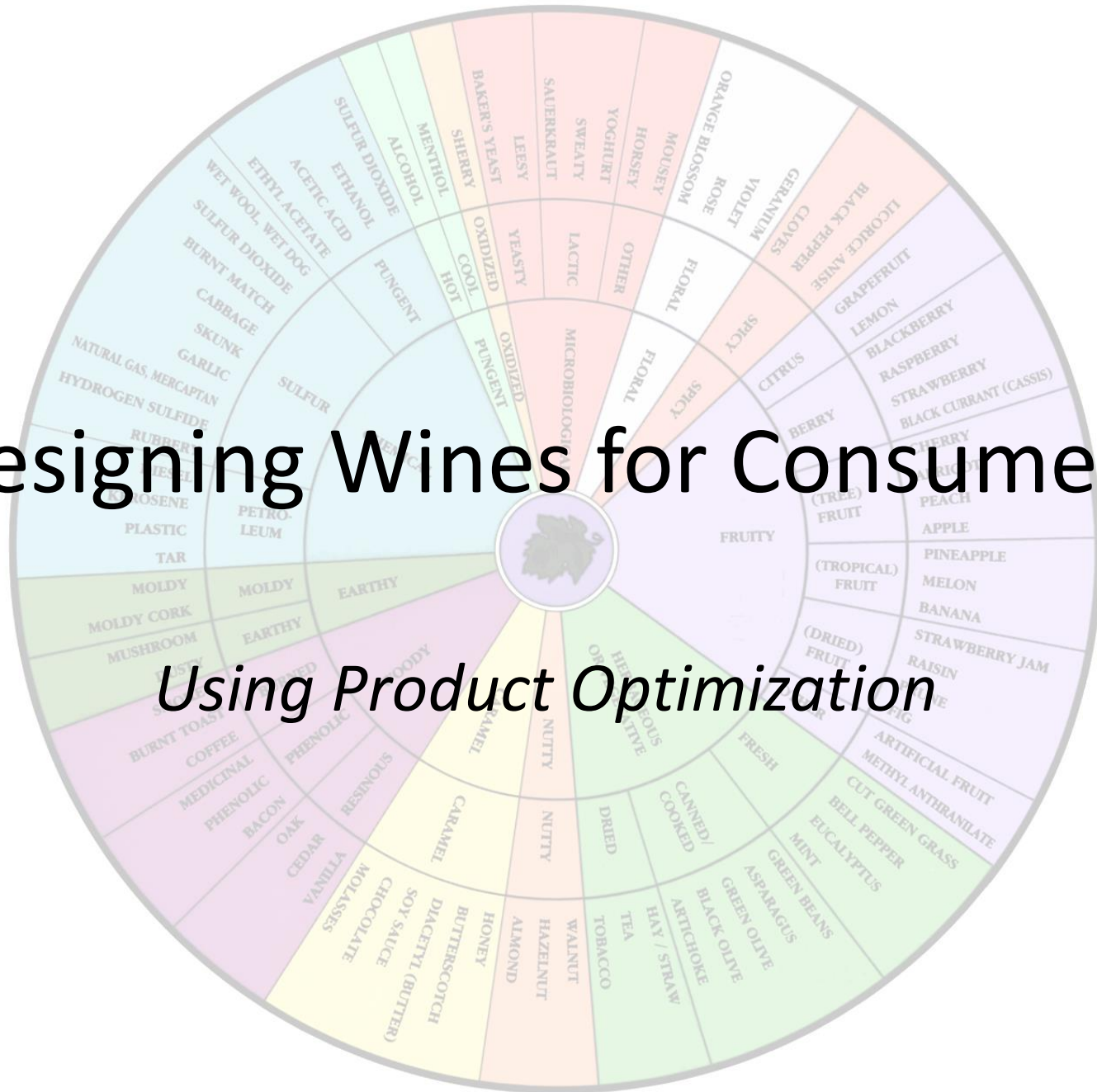
Practical tips for in-house tastings



- **BLIND**, always blind!
 - **CODED**, not letters
 - **RANDOMIZED**, with different order for each person
 - **RATE** liking using numerical or worded scale, **do not RANK** (1st, 2nd)
 - Recommend Overall Liking “Dislike Extremely” (=1) to “Like Extremely” (=9)
 - Can run stats easily using Excel
 - **Experts will not agree**: Is it “added complexity” or subtle “V.A.”?!
 - Expect “**house palate**” issues....
-

Designing Wines for Consumers

Using Product Optimization

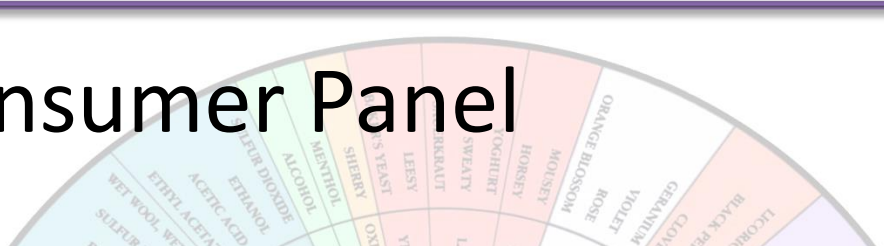


Do winemakers understand what consumers REALLY want?



- Are decisions on wine style/ blending made by a few “expert” individuals?
 - Do decisions reflective of wants and needs of consumer? How do they know?
 - Are there “blind spots” in the experts’ sensory acuity? Bitterness? Sourness?
 - Does wine portfolio cover breadth of “sensory space” desired by consumers?
 - How can you determine gaps and overlaps?
-

Expert Taster vs. Consumer Panel



Traditional Methods

Expert tasters- winemaker, might not be user or liker of category being tested. **N ≥ 1, typically**

Blind? Coded? Randomized?

NO, *not always*

Wine quality evaluations are notoriously “subjective” and vague.

Ranking for preference often used

House palate is often a major issue

Consumer Panel

Target and opportunity target
consumer N=100+

Correct experimental design, all samples coded & presentation order balanced

Acceptance **rating** on 9-point hedonic scale can be statistically analyzed

NEVER use ranking!

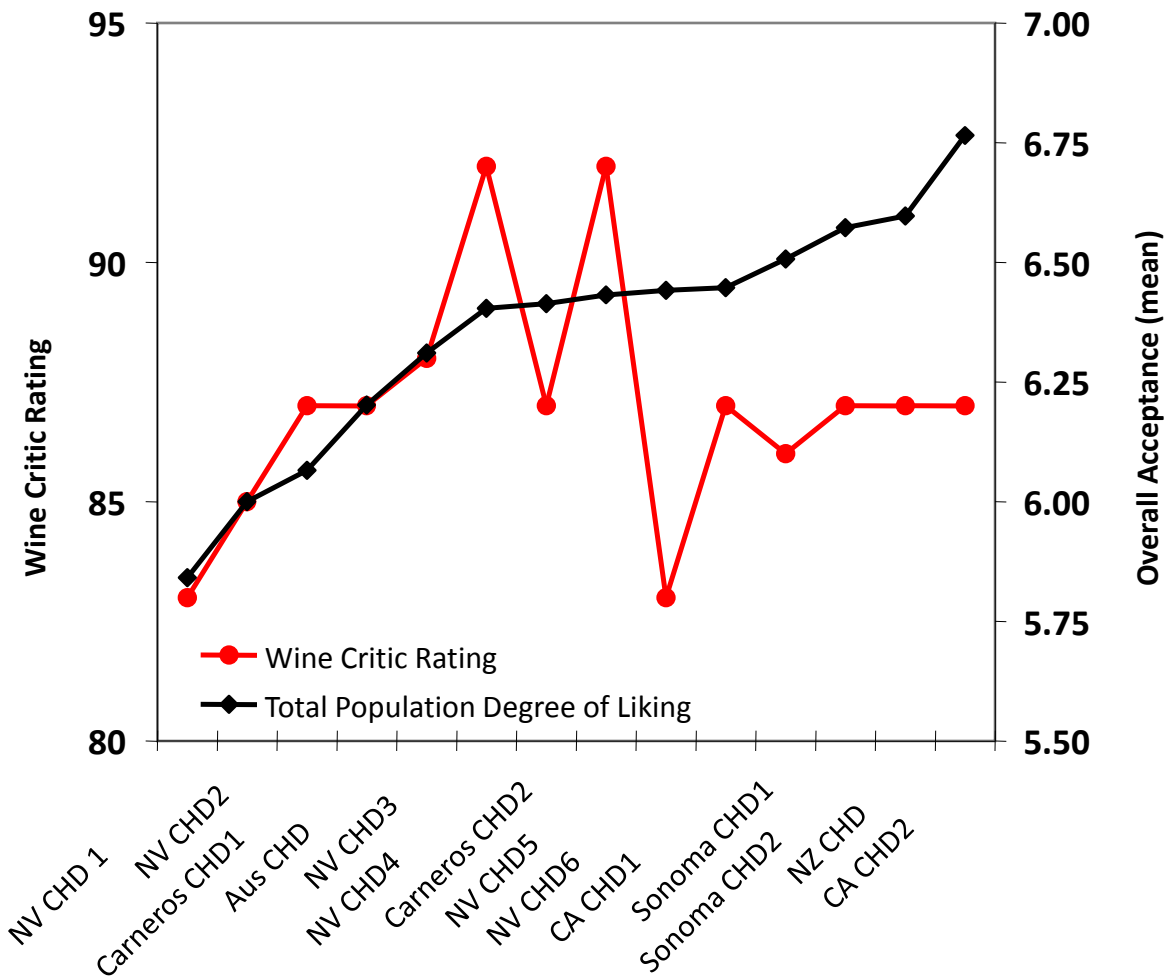
No “house palate”. Nor influence of brand knowledge

So, it's not surprising that experts and consumers may not agree!

So, do consumers agree with wine critics?

Correlations between Consumer and Wine Critic Data

NO relationship between wine critic ratings and consumer liking.



Or.... Is your Target Consumer....

... Rather more broadly defined?

Consumers are different; they look different and their attitudes and perceptions are different....

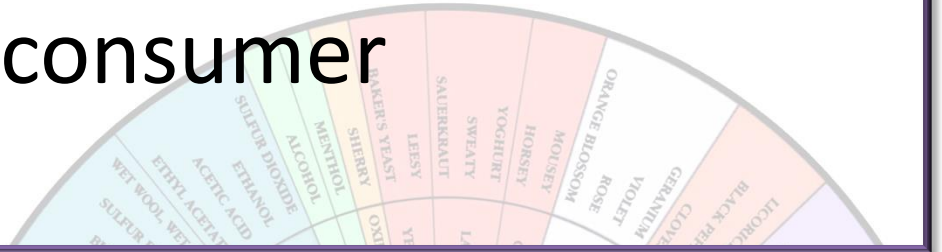


A Few Facts About Consumers



- Consumers do not agree about what they like
 - Their sensory skills are not equal.
 - Consumers are more sensitive to products they typically use
 - Consumers can easily express a preference; however, justifying that preference leads to complications.
-

How do we measure consumer perception?



By gathering **quantitative** information on wine attributes and consumer preferences:

1. Using **“Quantitative Descriptive Analysis”**, QDA, a screened panel of 10 - 12 people describe and quantify wine attributes
 2. Collecting preference data from **target consumers (N=100+)**
 3. **Mapping product similarities and differences**, and relating these to **consumer preferences**.
-

Quantitative Descriptive Analysis

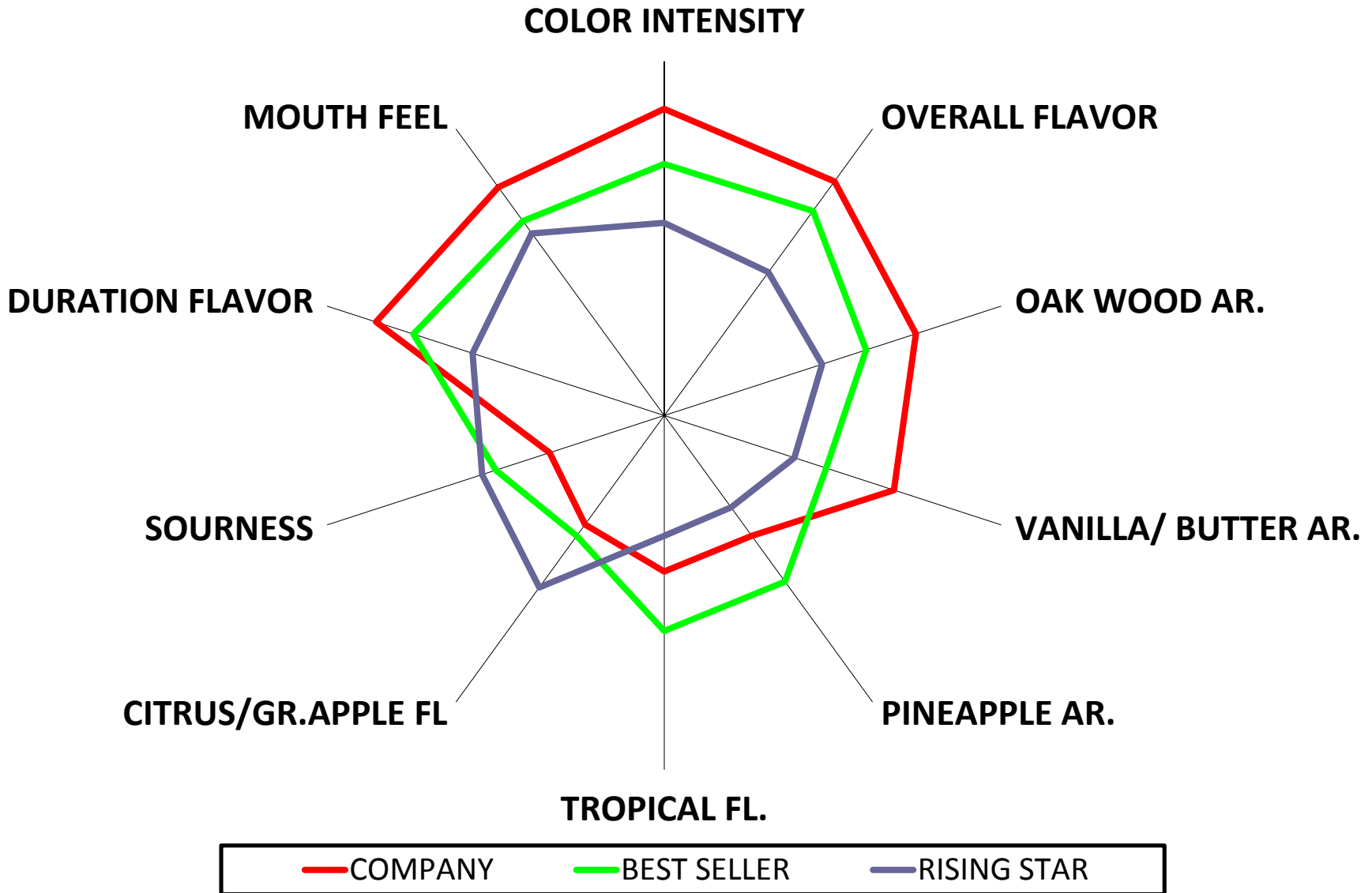
Methodology



Tragon QDA[®] is a research method that measures product sensory characteristics , using a trained panel .

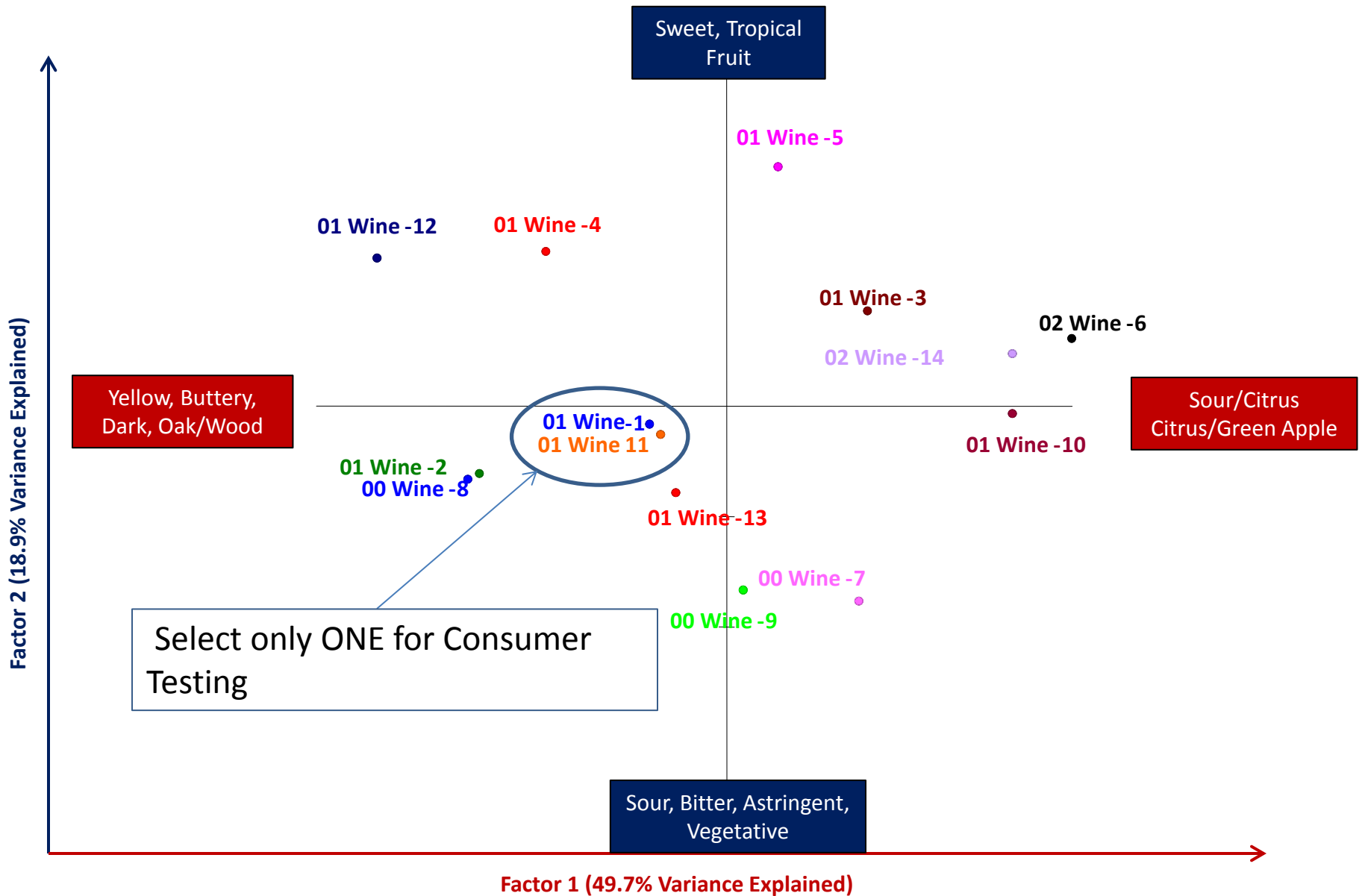
- 25 to 30 subjects recruited for **screening** tests
 - 12 to 14 selected
 - **Language development** sessions
 - **Objective**, not subjective language
 - Typically **25 to 50 sensory terms** are used
 - Each product rated **four times**; sufficient for statistical analysis.
-

Descriptive Profiles of Commercial Chardonnays



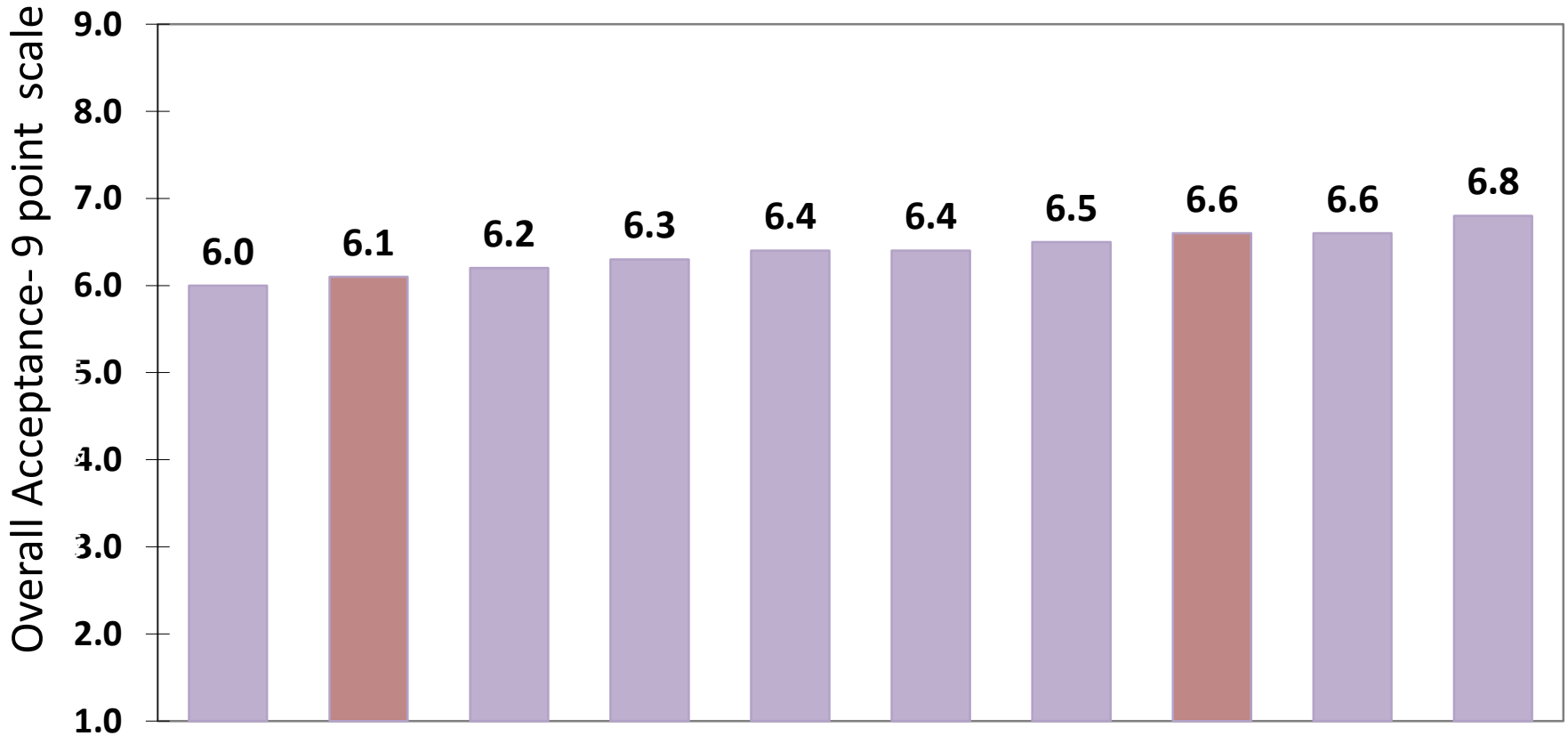
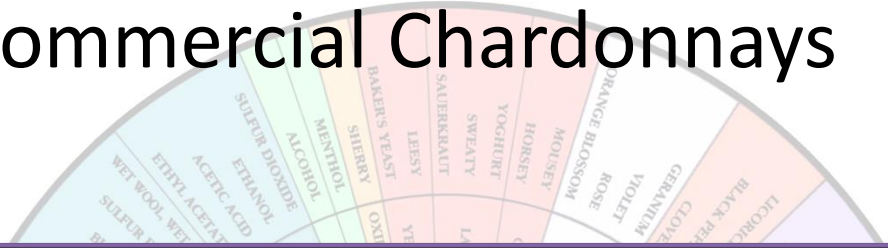
Principle Component Analysis (PCA) of QDA Data

Identifies similarities and differences

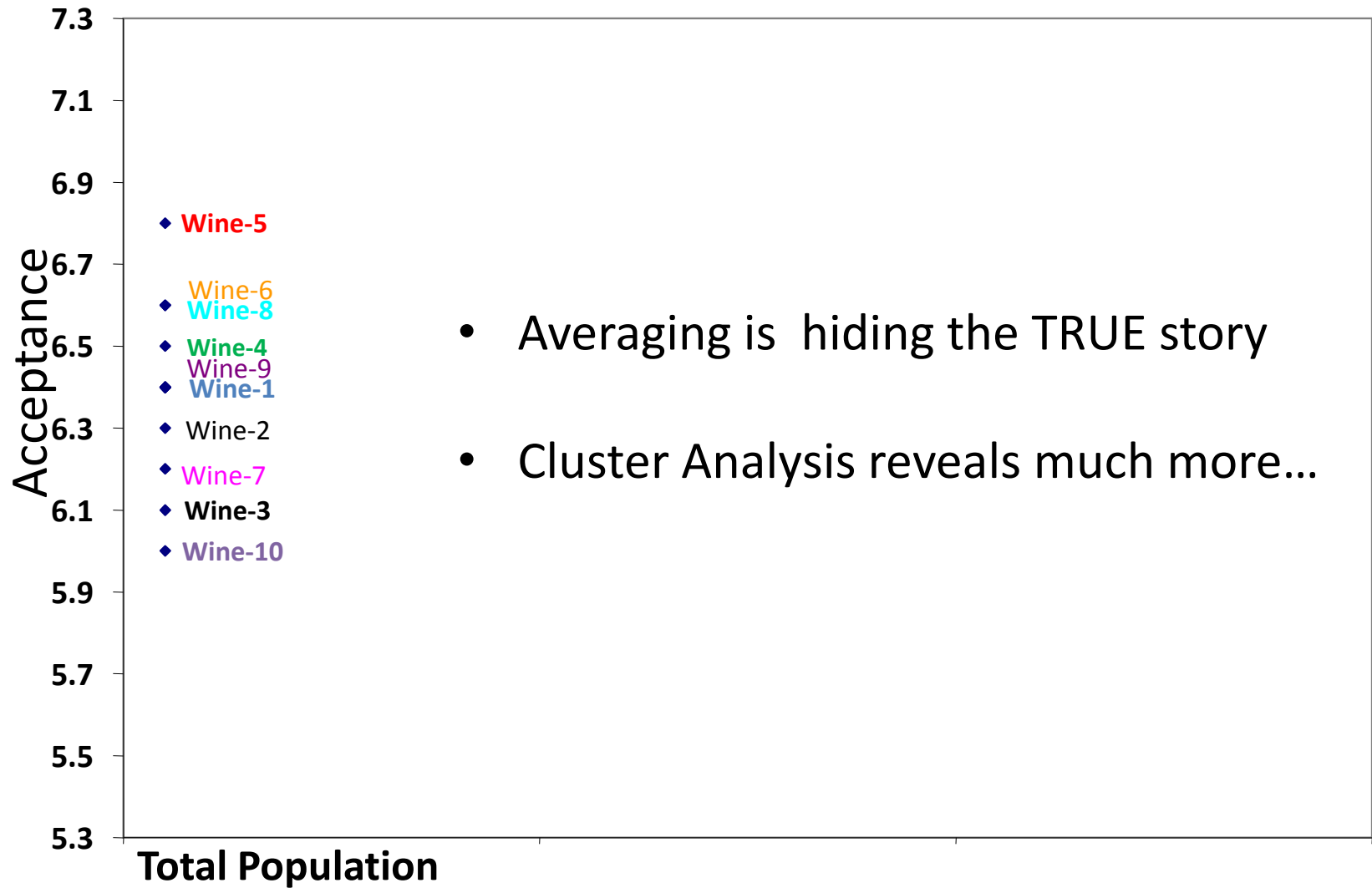


Overall Acceptance of Commercial Chardonnays

Target Consumers- N=150



Total Population data may mislead...

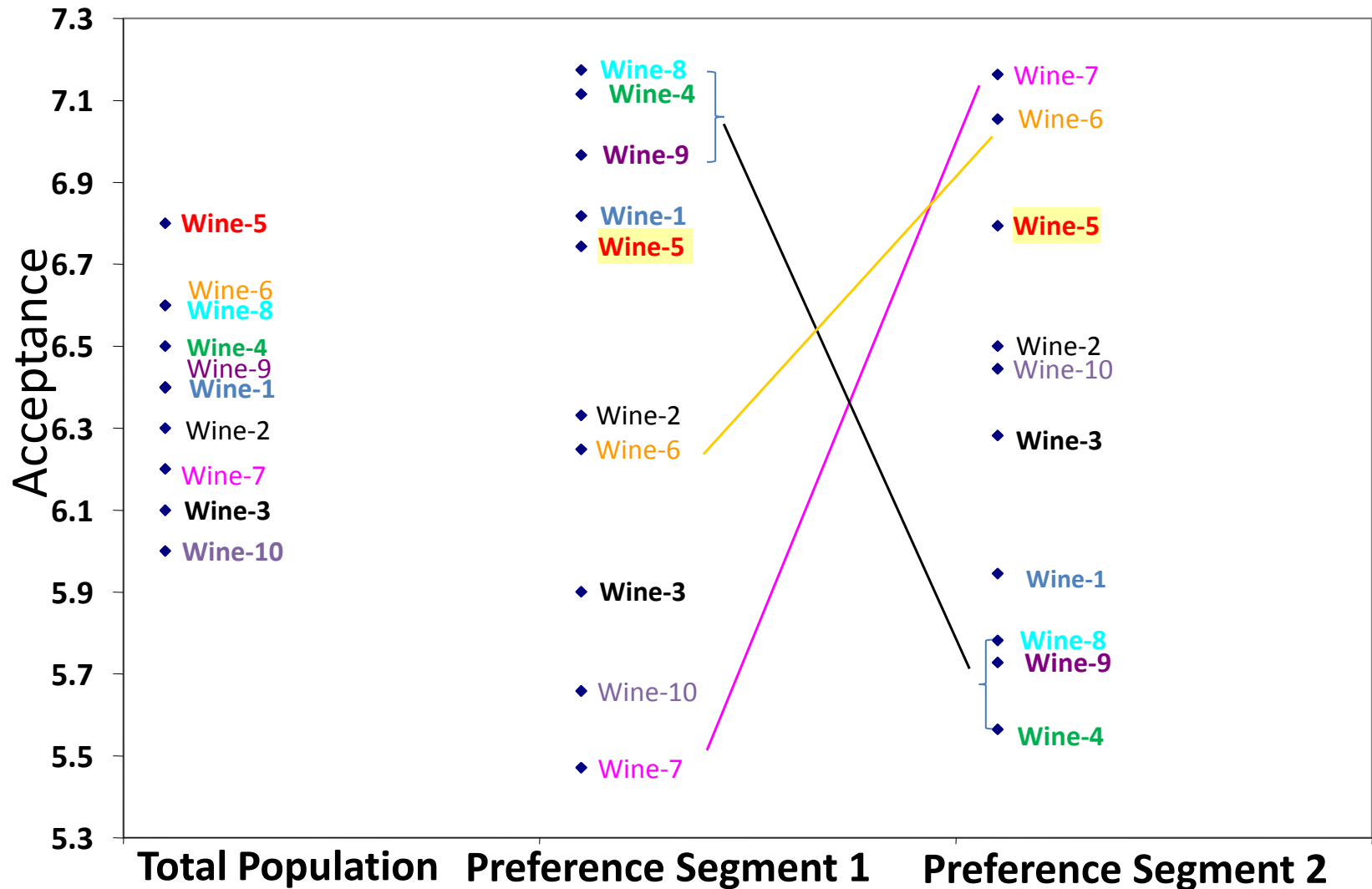


- Averaging is hiding the TRUE story
- Cluster Analysis reveals much more...

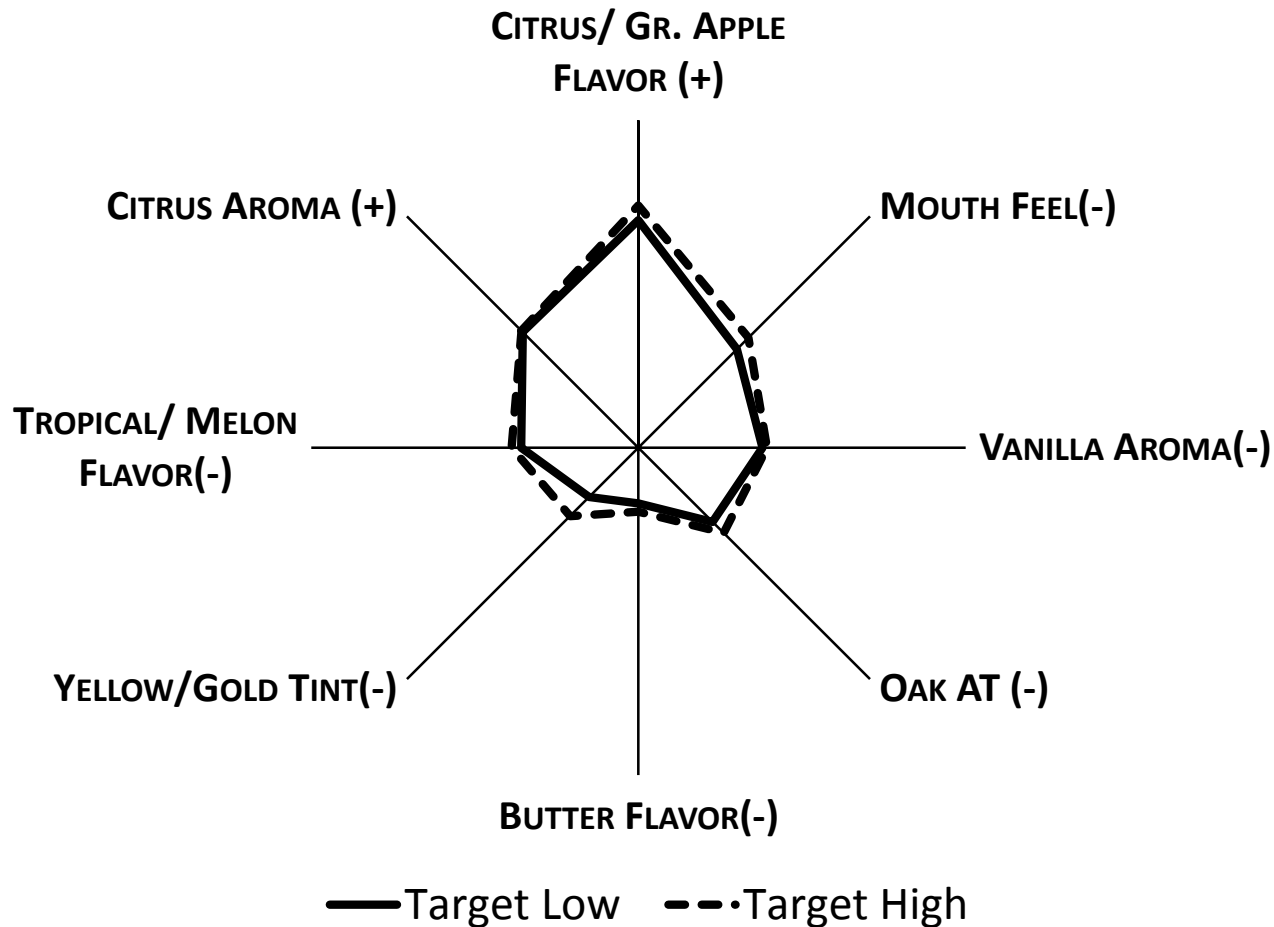
Cluster Analysis reveals strong likes and dislikes....



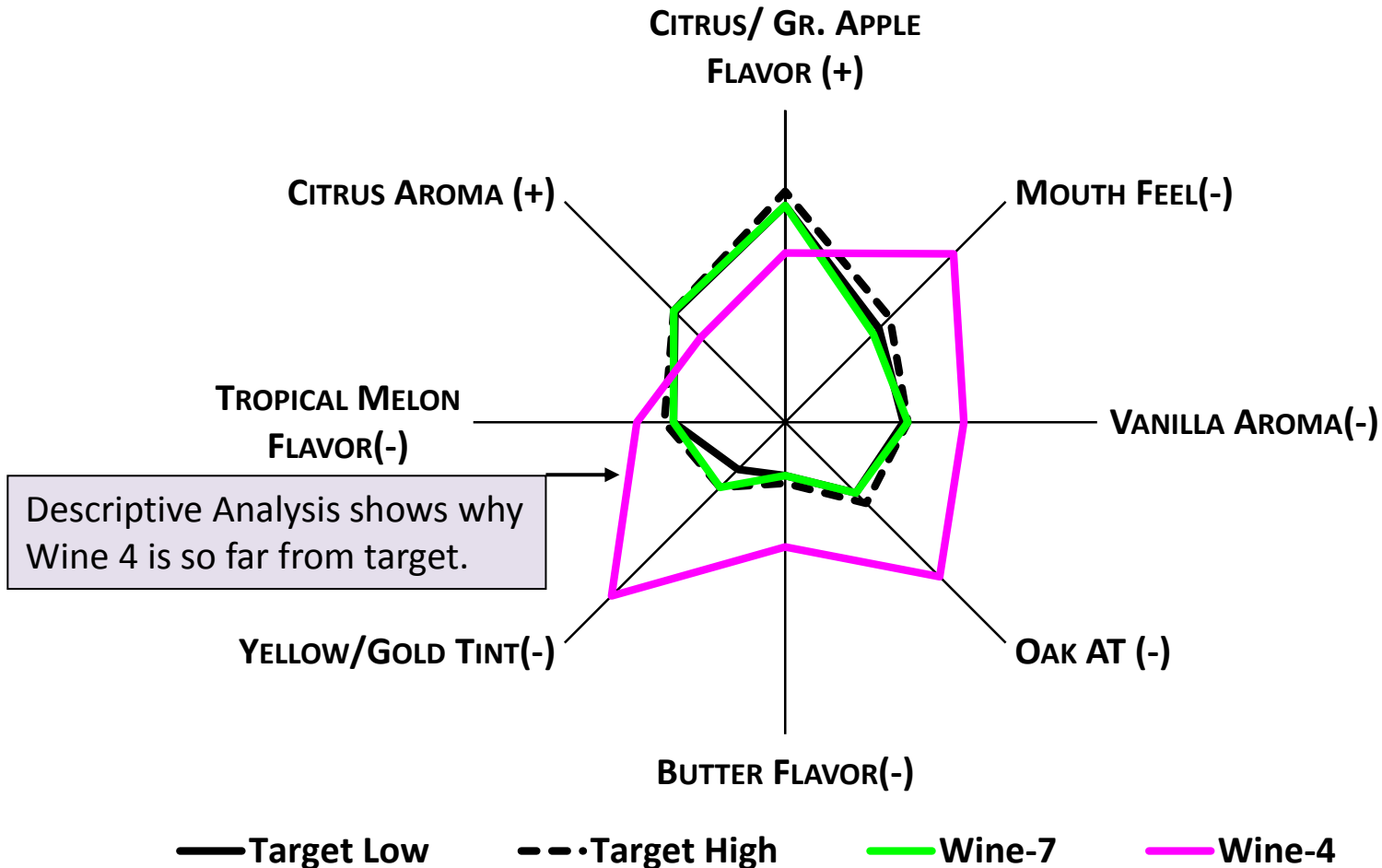
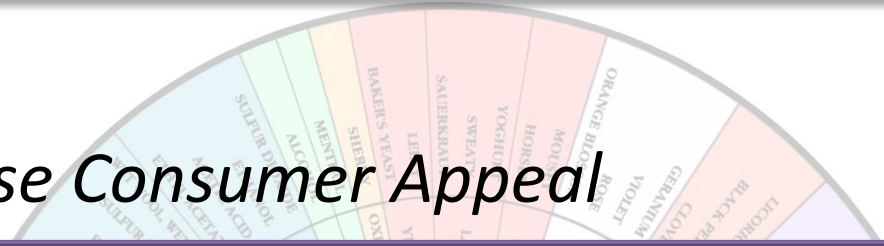
Two almost opposite Preference Segments exist...



The True Power of Descriptive Analysis- *Discovering the “Whys” of Liking*



Descriptive Analysis- Blending Wines to Maximise Consumer Appeal



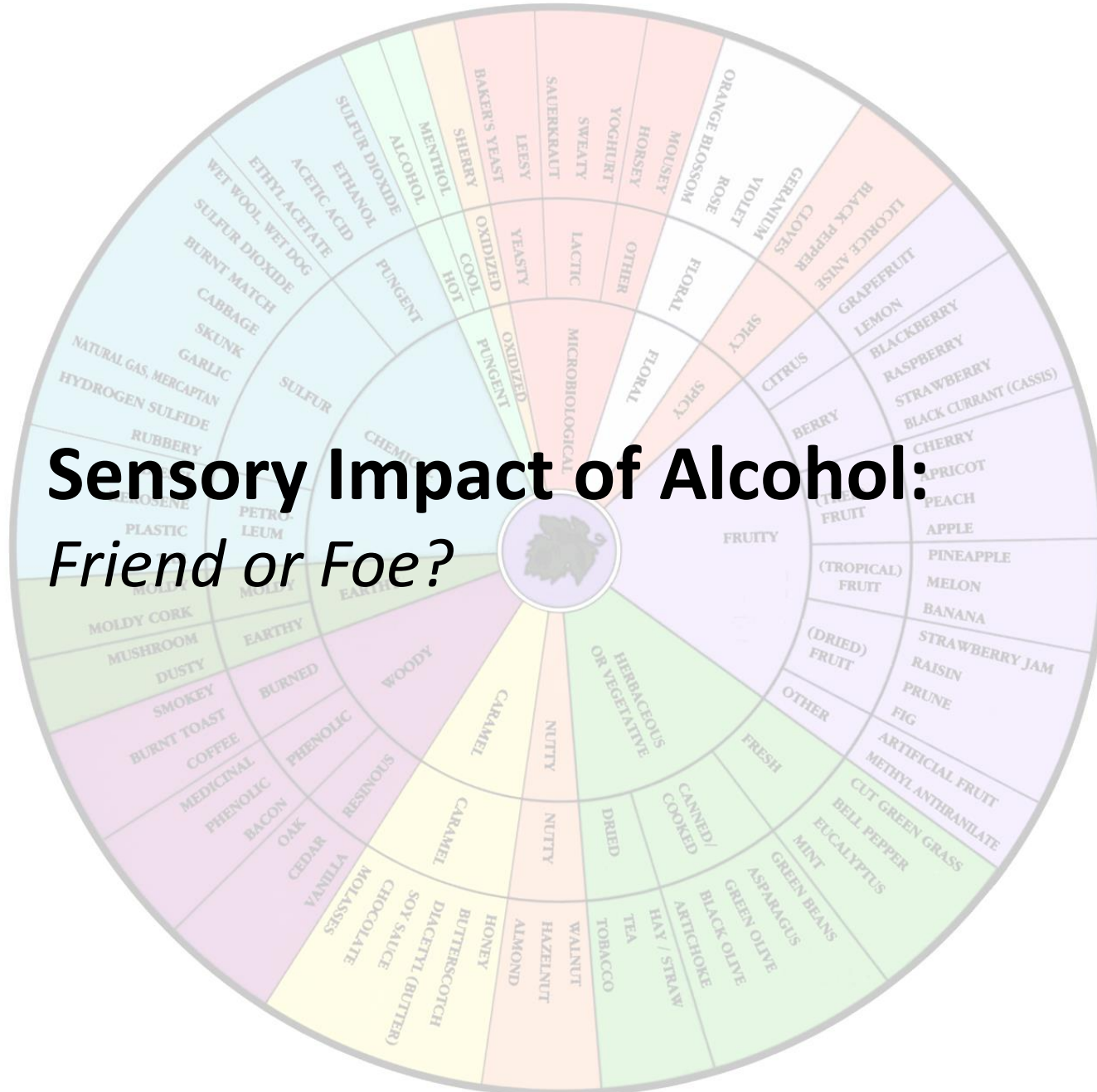
Smart use of Sensory has benefits-

Even for smaller wineries...



- **Scientific, reproducible** evaluations at every stage of winemaking
- **Smart decisions** during blending, no more N=1 opinions
- **Style guidance** for winemakers, useful additional tool
- **Directly targeting the competition**
- **Creating new innovative styles**
- Generates high likelihood of **REPEAT PURCHASE**
- Yes, this **MOVES CASES!**

Sensory Impact of Alcohol: *Friend or Foe?*



Sensory Impacts of Alcohol

What's really being investigated?

Higher ripeness leads to higher alcohol.

Sensory effects of ripeness in REDS:

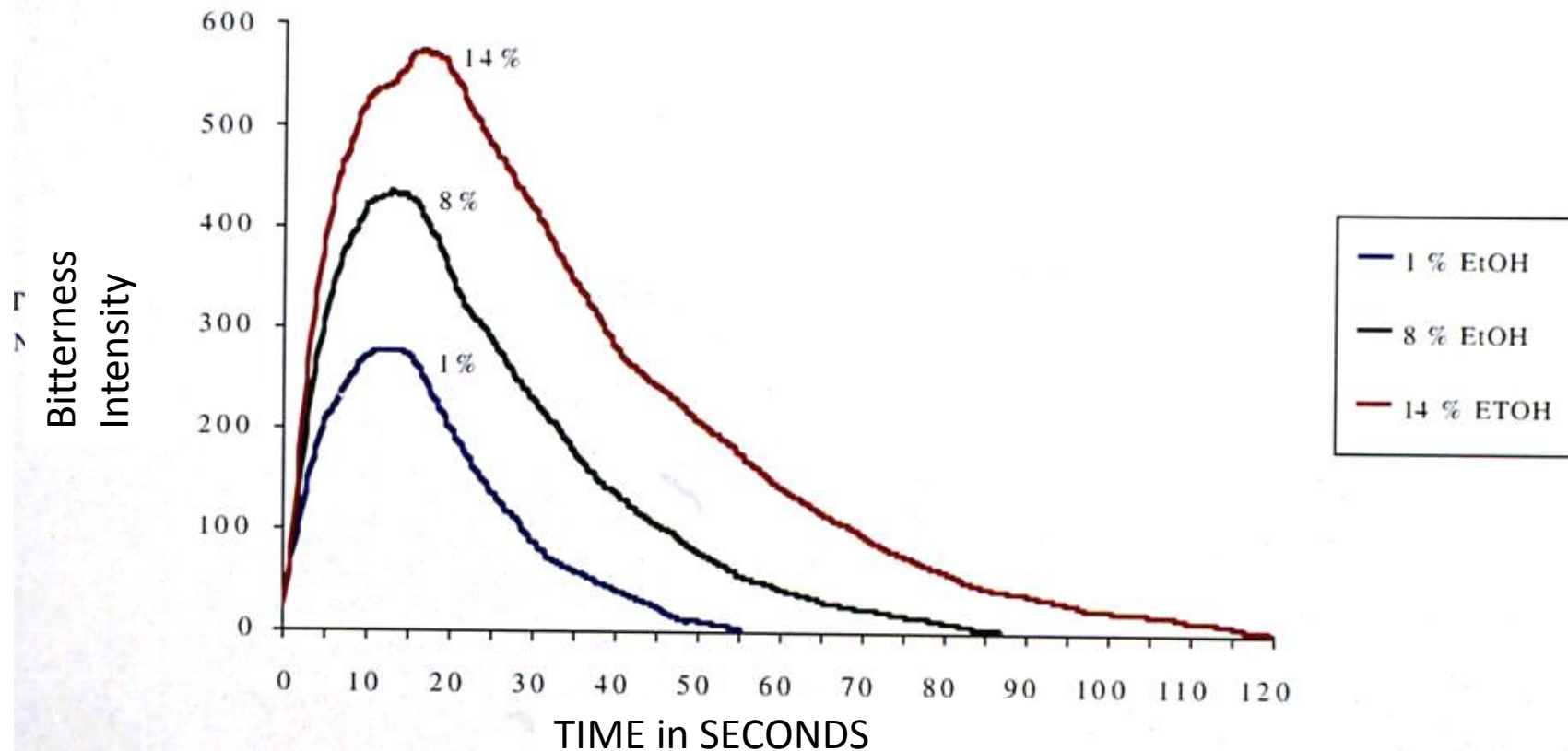
- Pyrazines / vegetative notes diminish after veraison
- Ripe berry fruit increases, moving to prune/raisin tones in over-ripe fruit.
- Sourness, bitterness decrease
- Wines with ZERO Residual Sugar may appear “sweet”



SO research on alcohol concentration ALONE can be very enlightening...

Impact of ethanol on bitterness over time in a white wine

Influence of Ethanol on Bitterness
(1500 mg Tannin, pH 3.6)



Effect of Alcohol on Wine Sensory Properties

Evidence from research publications shows:



Higher alcohol *increases*:

- Visual viscosity called the **Marangoni effect** (Gugliotti & Todd, 2004).
- Mouthfeel viscosity, sometimes...

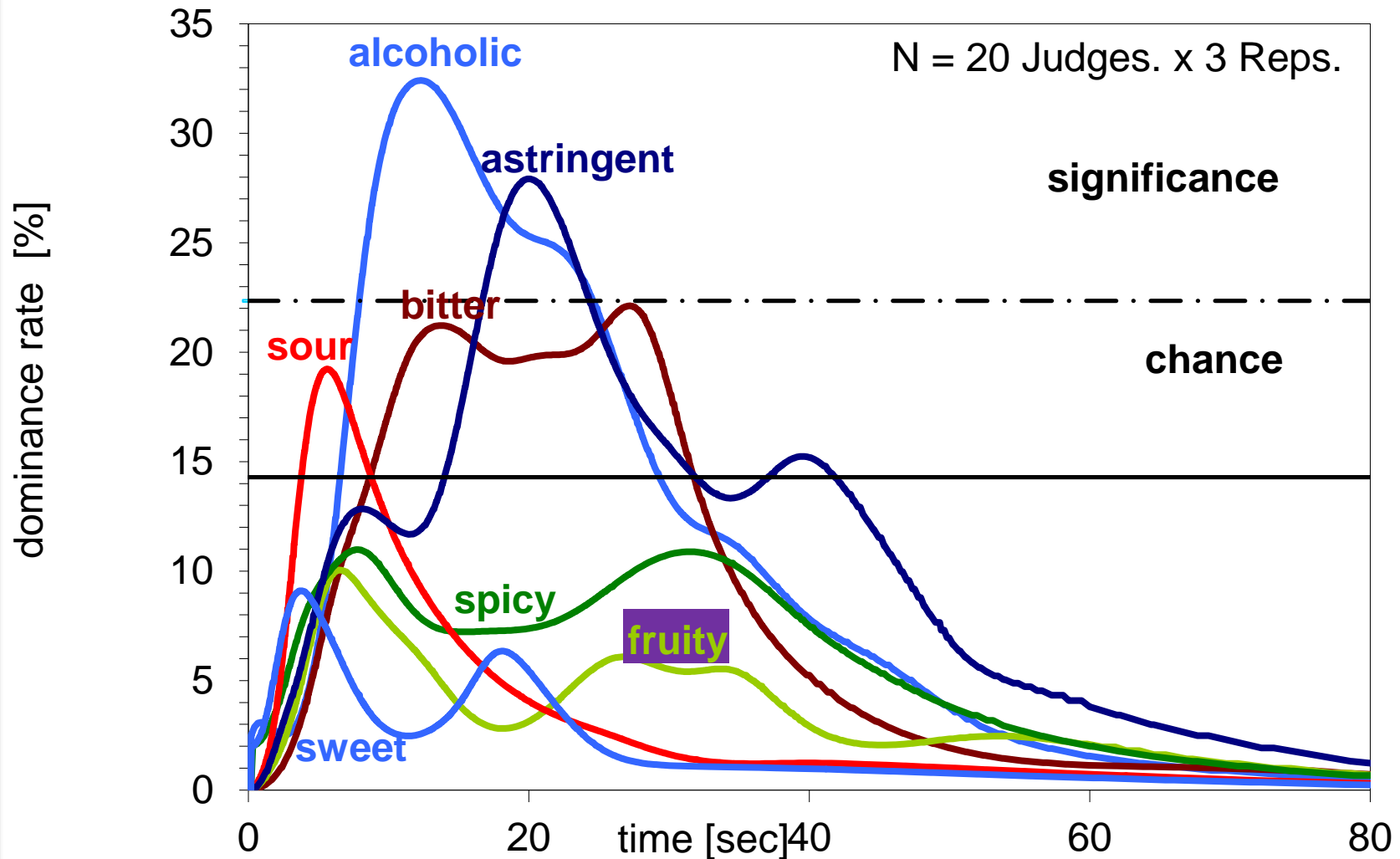
It can also:

- Increase sweetness
 - Decrease sourness
 - Decrease fruitiness
 - Add a “metallic” character
 - Add a “hotness” or burning sensation

 - Increase bitterness and astringency
-

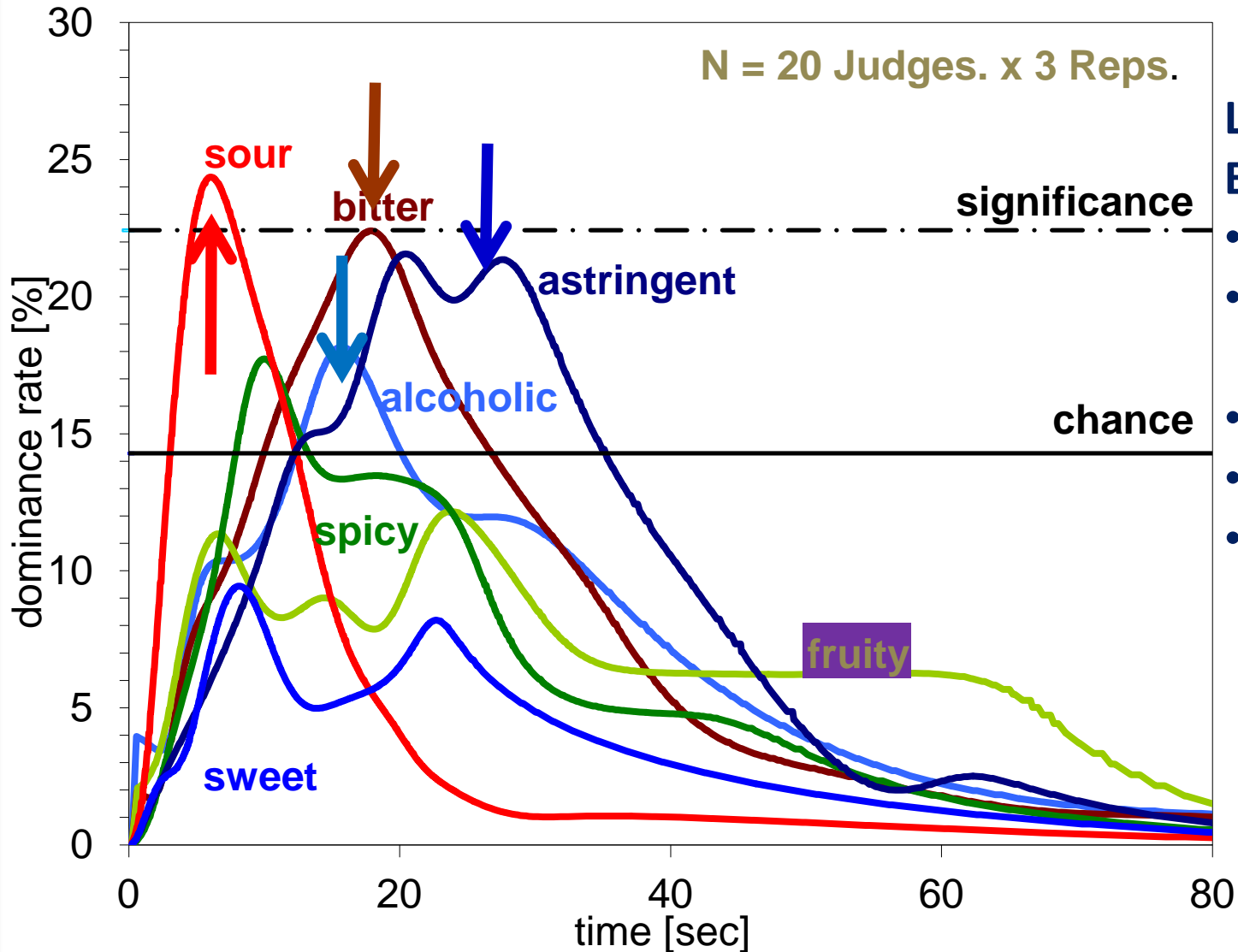
Wine Characteristics over Time

2011 Pinot Noir at **15.3 % alcohol**



Wine Characteristics over Time

2011 Pinot Noir at **13.3 % alcohol**



Lower Alcohol Effect

- MORE sour
- MORE fruity
- LESS alcoholic
- LESS astringent
- LESS bitter

Sensory Impacts of Alcohol

Friend or Foe?

Higher alcohol indicates ripeness level

LOWEST *Balance between under-ripe, just ripe, fully-physiologically ripe, to over-ripe*

- High Pyrazines /vegetative notes = FOE
- Green tannins and high bitterness= FOE
- High sourness= FOE?
- Berry fruit increases, as vegetables decrease = FRIEND
- Tannins soften, and sourness, bitterness decrease = FRIEND
- Varietal character shines= FRIEND
- Prune/ raisin tones in over-ripe fruit= FOE
- Wine tastes hot and extracted = FOE
- Wine gets flabby, acidity far too low = FOE?



HIGHEST

Stay tuned....

Research of the effect of Alcohol on Tasting order to come!

