



# Sensory Evaluation of Wine Faults

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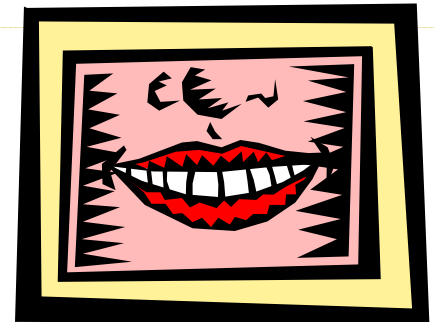
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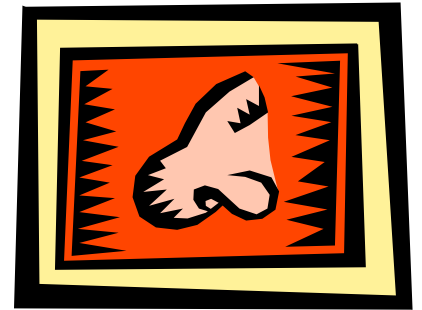


# Gustatory Faults

- Most are obvious to the nose
- Need only confirmation by palate
  - Metal contamination
- Structure of the wine:
  - Are elements in balance?
  - Harsh, sour palate?
  - Excessively tannic, bitter, astringent?
- Sample in mouth, residence time of ~10 seconds

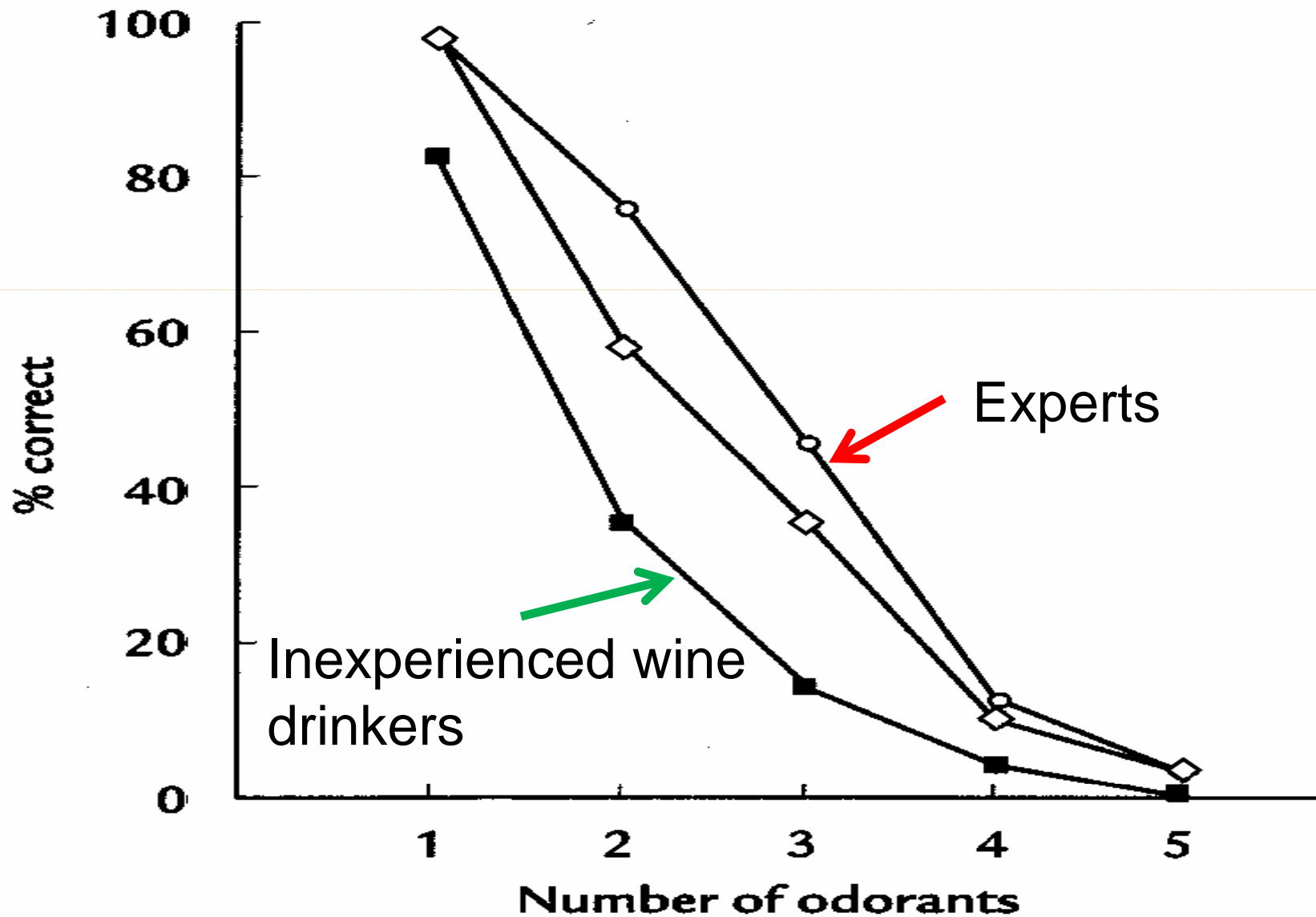


# Smellable Faults

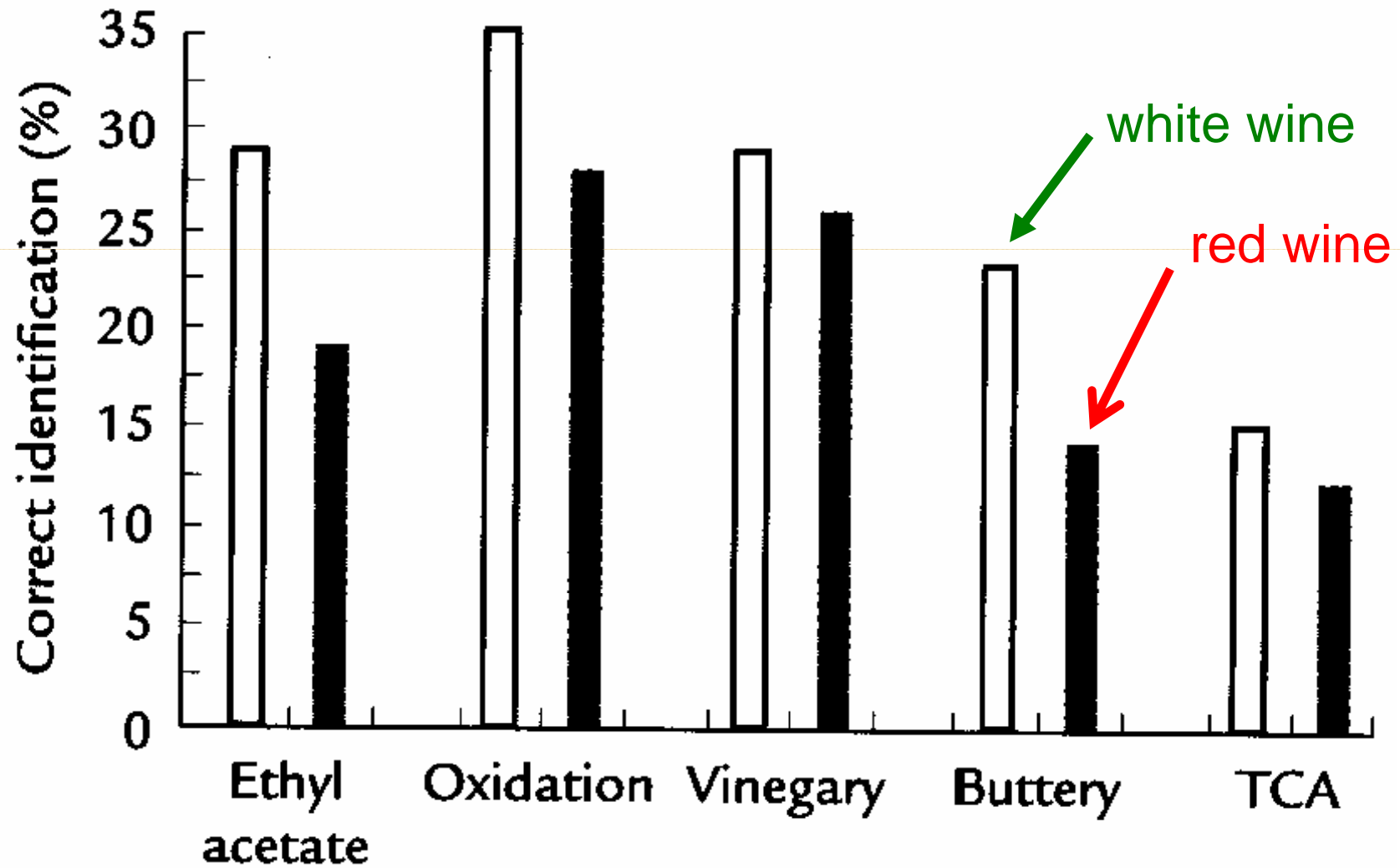


- Most likely to detect on the nose than palate
  - Taste and mouthfeel can add extra “noise”
- Technique:
  - Swirl wine
  - 2-3 short sniffs
  - Rest nose (about 30 sec)
  - Sensitivity to many faults diminishes with repeated sniffing

# Ability to distinguish wine aromas



# Detection of faults in wines



(Jackson, 2002)



Take a sniff....

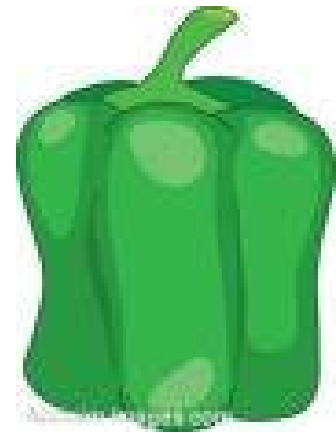


# WINE FAULT I

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# Vegetative Odours

- Green, grassy, herbaceous, stemmy, vegetative character
  - May be reminiscent of unripe fruit and become more dominant as wine ages
- Caused by presence of “leaf” aldehydes and alcohols
  - Contain 6 carbon atoms ( $C_6$ )
- Presence of pyrazines





# Vegetative Odours

- May be desirable and considered part of typicality
  - Sauvignon Blanc, Semillon, some Bordeaux reds
- Vineyard Prevention:
  - Avoid excessive water, over-cropping
  - Increase sun exposure
  - Longer hangtime
  - Other vineyard factors...
  - Dr. Gavin Sacks' presentation



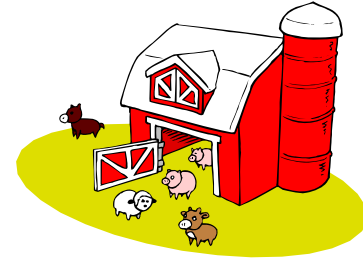
Take a sniff....



# WINE FAULT 2

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# Brettanomyces



- Described as barnyard, “bandaid”, fecal, mousy, wet dog
- Controversial wine fault
  - At low concentrations, some winemakers feel it adds complexity
  - Associated with classic Burgundy and Bordeaux
- Compounds:
  - isovaleric acid, guaiacol, 4-ethyl guaiacol, 4-ethyl phenol, 4-vinyl phenol



# Brettanomyces

- Associated with aromas and flavours contributed by wild yeasts from *Brettanomyces* and *Dekkera* genus
- Isolated from many sources
  - Causes: low SO<sub>2</sub>, elevated storage temperatures, infection during barrel storage



# Brettanomyces

- Some suggestions on how to control:
  - Keep pH of wine low
  - Maintain adequate levels of anti-microbial  $\text{SO}_2$
  - Store wine at cool temperature
  - Maintain clean winemaking conditions
  - Suggestions from Dr. Henick-Kling



Take a sniff....

 **WINE FAULT 3**

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# Ladybeetle (MALB) Taint



# Ladybeetle (MALB) Taint

- WA State Merlot
- Sensory panel
  - Paired difference test to compare tainted wine with control wine
  - 32 untrained panelists
- Attributes under study:
  - Aroma: floral/fruity, musty/earthy, vegetal
  - Flavour: green pepper, earthy, sour, bitter
  - Lingering mouthfeel
  - “Which wine has a stronger \_\_\_\_\_ aroma/flavour?”

# Ladybeetle (MALB) Taint



- Aroma results:
  - Tainted wine lower in floral/fruity, higher in musty/earthy
  - Untainted wine more preferred
- Flavour/Mouthfeel results:
  - Tainted wine higher in green pepper, sourness
  - Tainted wine lower in lingering mouthfeel
- Detectable differences in MALB-tainted wines (same wine as sampled)



Take a sniff....

 **WINE FAULT 4**

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# Excessive Alcohol

- Or “too hot”
- Mouthfeel is affected by balance between ethanol, acidity and tannin levels
  - Dependent upon composition of grapes (“hang time”), metabolic activities of microbes, processing decisions by winemaker...





# Excessive Alcohol

- Commercial wines have increased in alcohol concentration
  - CA Cabernet Sauvignon
  - 1970's ~13% alcohol
  - 2001 ~15.1% alcohol
- Increasing alcohol concentration also impacts perceived aromas and flavours



Take a sniff....



# WINE FAULT 5

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# Harsh Tannins

- Tannins contribute to wine astringency
  - Component of mouthfeel
- Tannin precursors come from seeds and rest of grape
  - Ripeness of seeds at harvest, impact of processing on seeds influence type and level of tannin in the wine, ageing
  - Tannin management in winemaking and in the vineyard



# Harsh Tannins

- Different descriptors used
  - Soft (good), hard (not good), round (good), mature (good), young (not good), persistent (not good)
  - Mouthfeel Wheel (Gawel et al., 2003)



Take a sniff....



# WINE FAULT 6

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# Volatile Acidity

- Major component is acetic acid but also other acids (lactic, formic, butyric, propionic)
  - Due to presence of wine spoilage yeasts or acetic acid bacteria (acetobacter)
  - Metabolize ethanol to acetaldehyde and acetic acid
  - Acetic acid + ethanol form ethyl acetate



# Volatile Acidity

- Vinegar aromas often accompany nail polish notes
- Ethyl acetate detectable at lower levels than acetic acid
  - Acetic acid thresholds 100x higher than EA
- Due to presence of spoilage microbes, contaminant of thin-skinned varieties, damaged fruit, low SO<sub>2</sub>, poor winery/barrel hygiene,

# Ethyl Acetate



- Nail polish remover
- Component of volatile acidity (VA)
- Low concentrations:
  - Enhance fruitiness, overall complexity
- High concentrations:
  - Generates an acetone-like off-odour
  - Detracts from wine
- Variation in sensitivity of individuals

# Finally...

- Many defects have both vineyard and winery origins
- Thanks!
  - Thanks to all for attending
  - Thanks to our speakers
  - Thanks to WAWGG for the opportunity
- Now.... Go out and have some good wine!

