

We will start momentarily at 2pm ET



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Thursday, August 18, 2011

The Science of Selling: Selling Science to Non-Scientists

Carol Nancy, CEO at Sequella, and Juliane Snowden, VP at Burns McClellan



Thursday, August 25, 2011

Small is Beautiful: Everyday Applications and Advances in Nanochemistry

Dr. Paul Weiss, editor of ACS Nano and Director of California NanoSystems Institute

Paul Weiss

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ACS WEBINARS™ August 11, 2011



Advances and Innovations in Wine Chemistry



Susan Ebeler,
University of California, Davis



Bill Courtney,
Cheese-ology,
St. Louis, MO

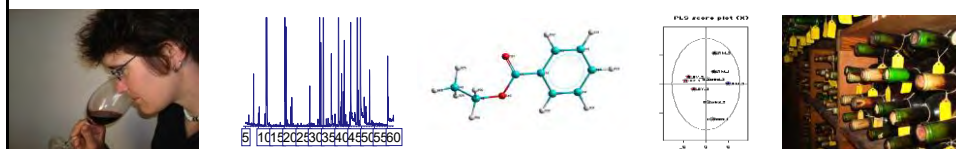
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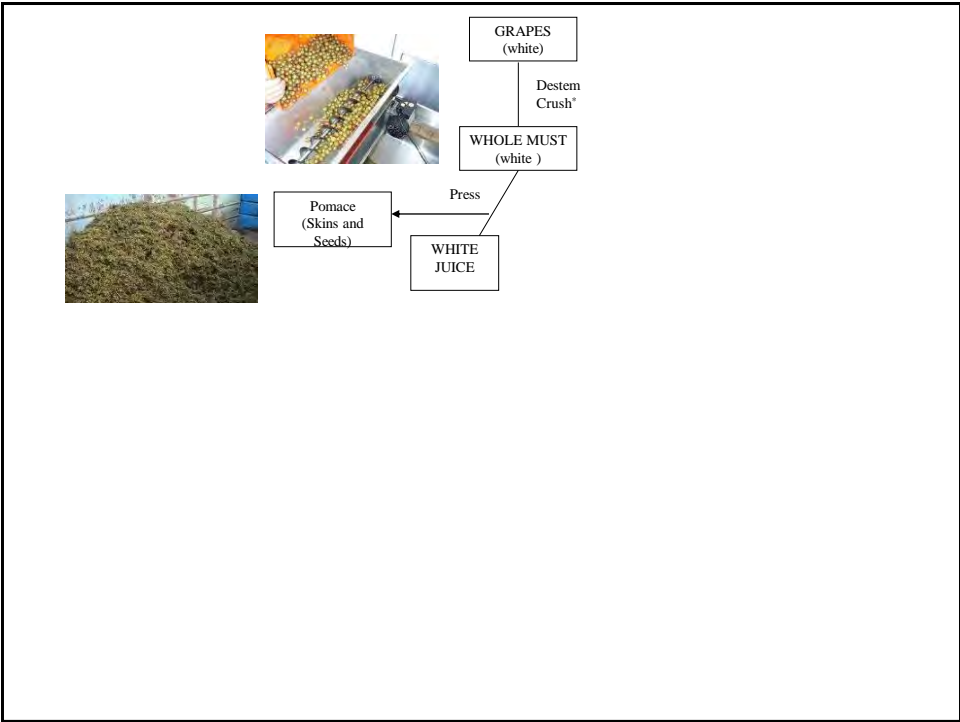
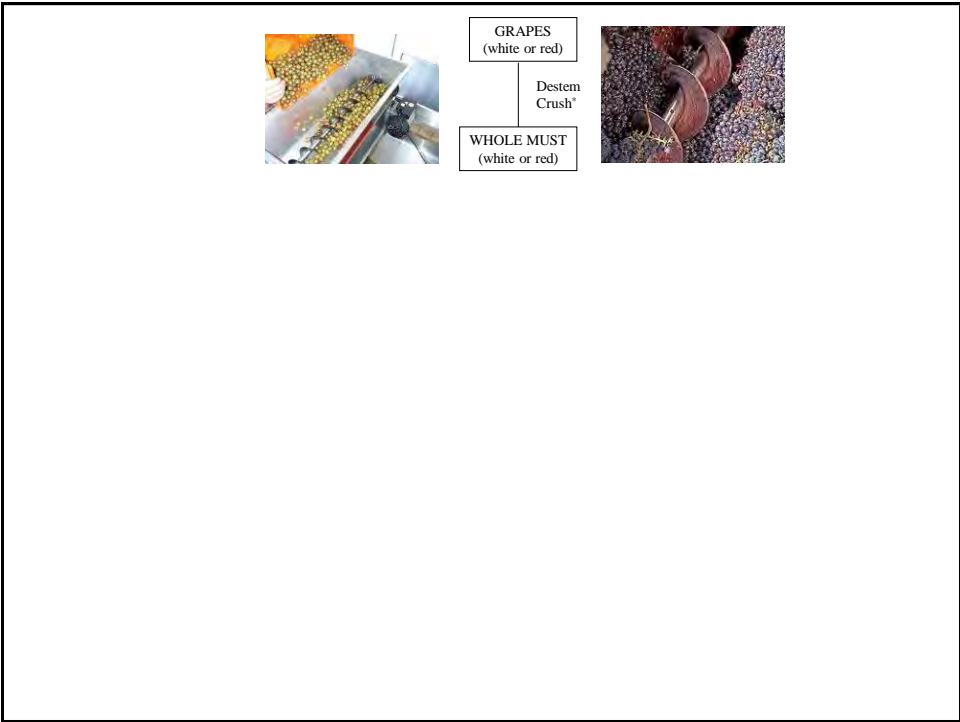
Advances and Innovations in Wine Chemistry and Flavor

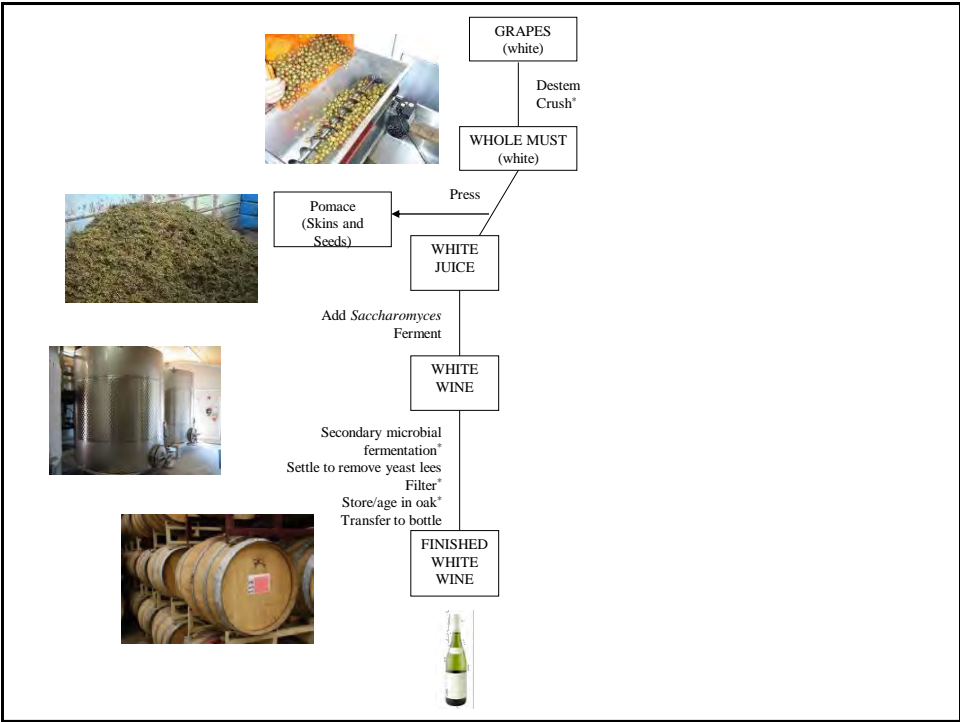
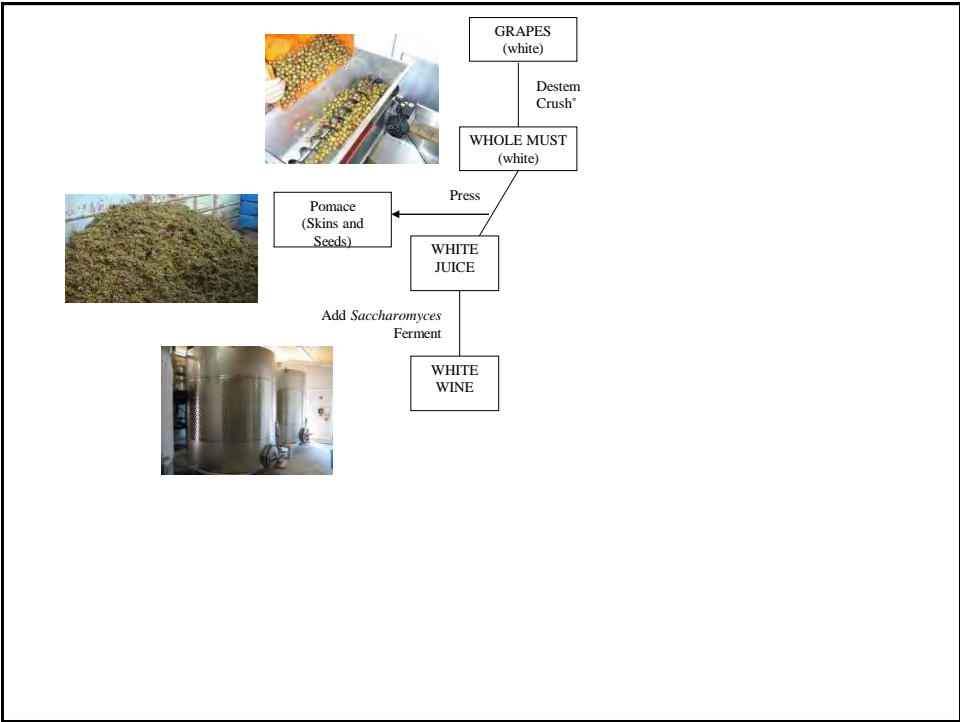
Susan E. Ebeler
Department of Viticulture and Enology
University of California, Davis, CA

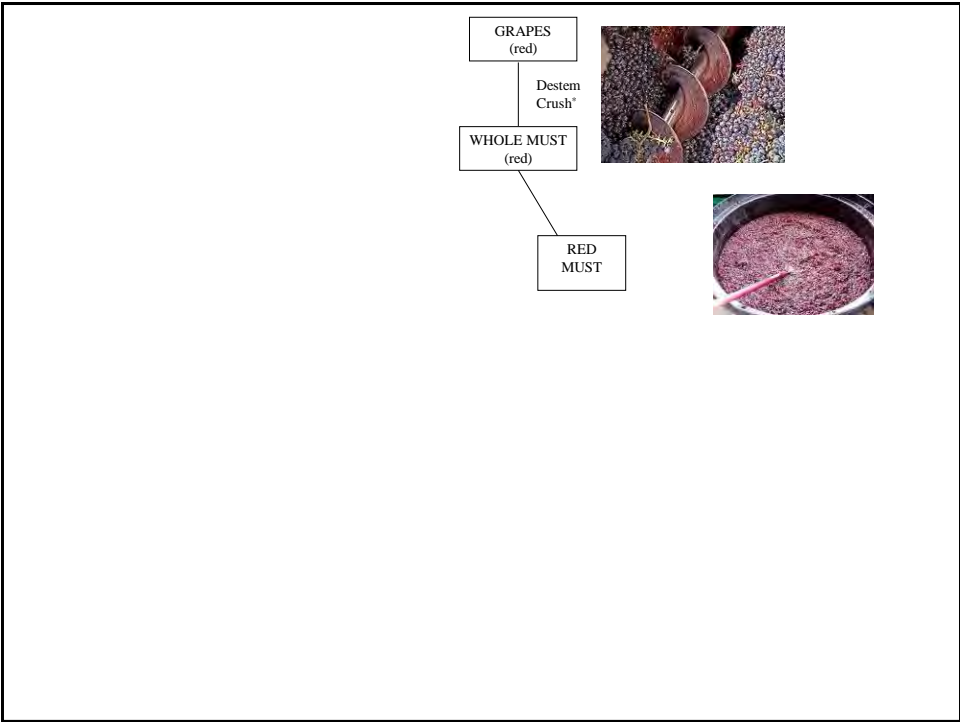
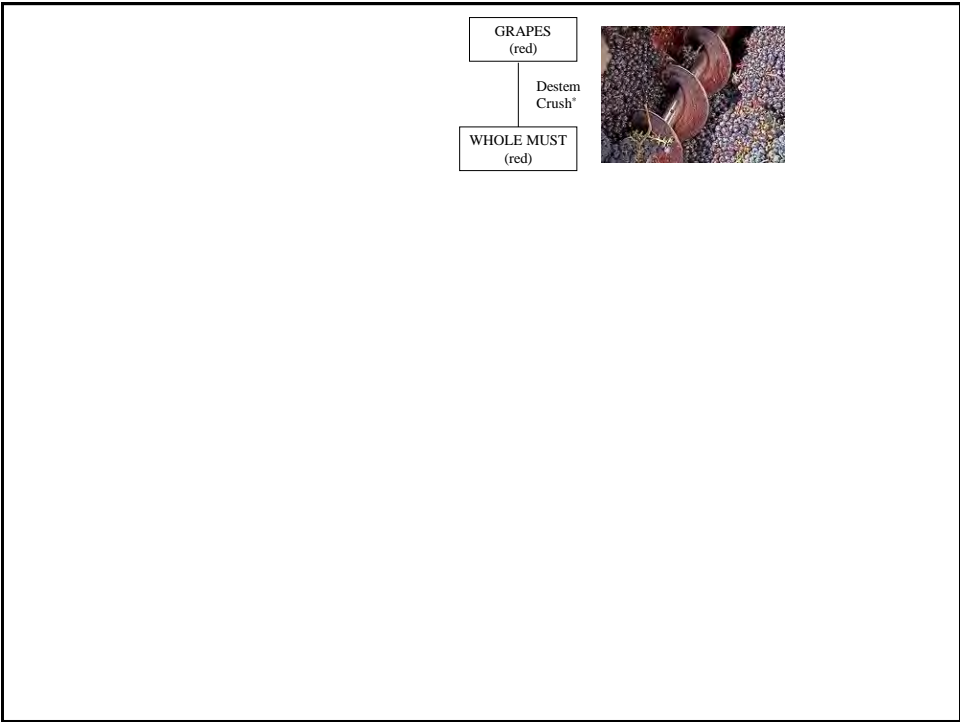


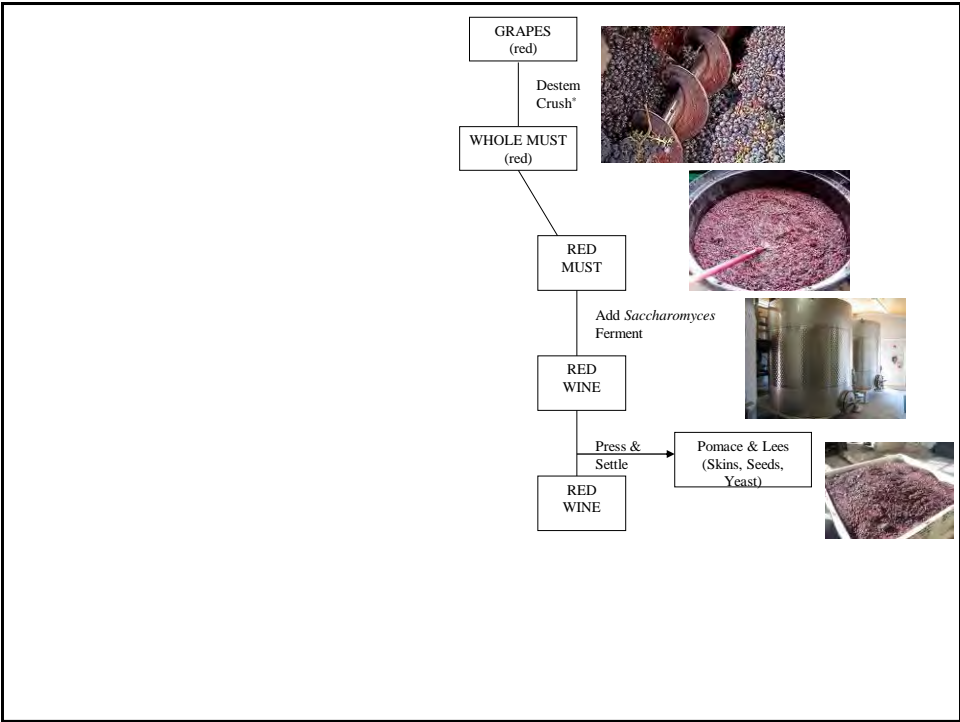
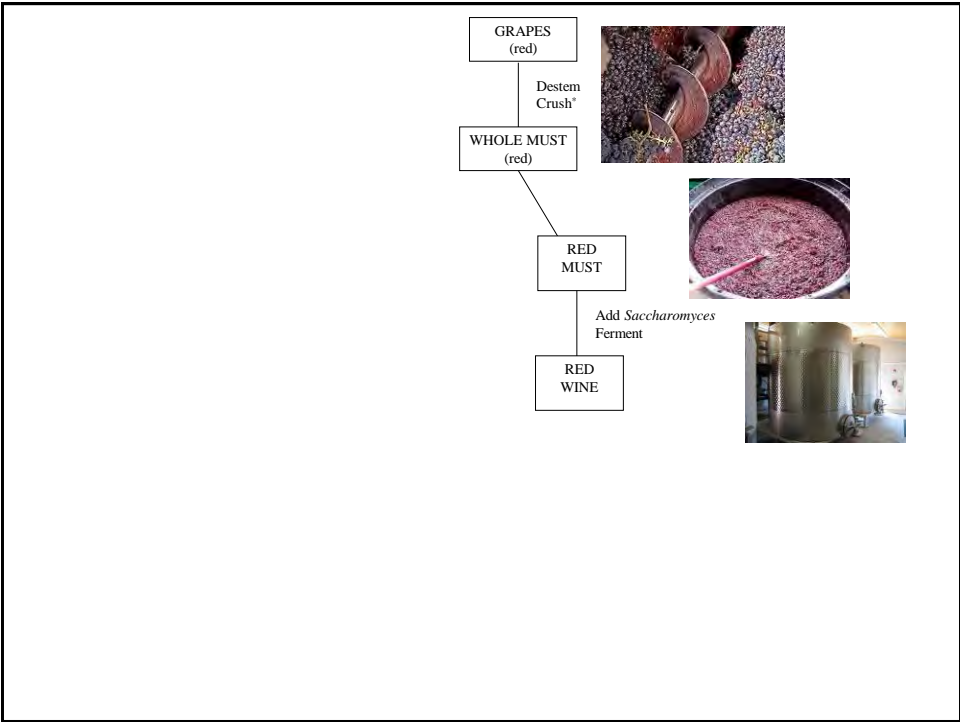
GRAPES
(white or red)

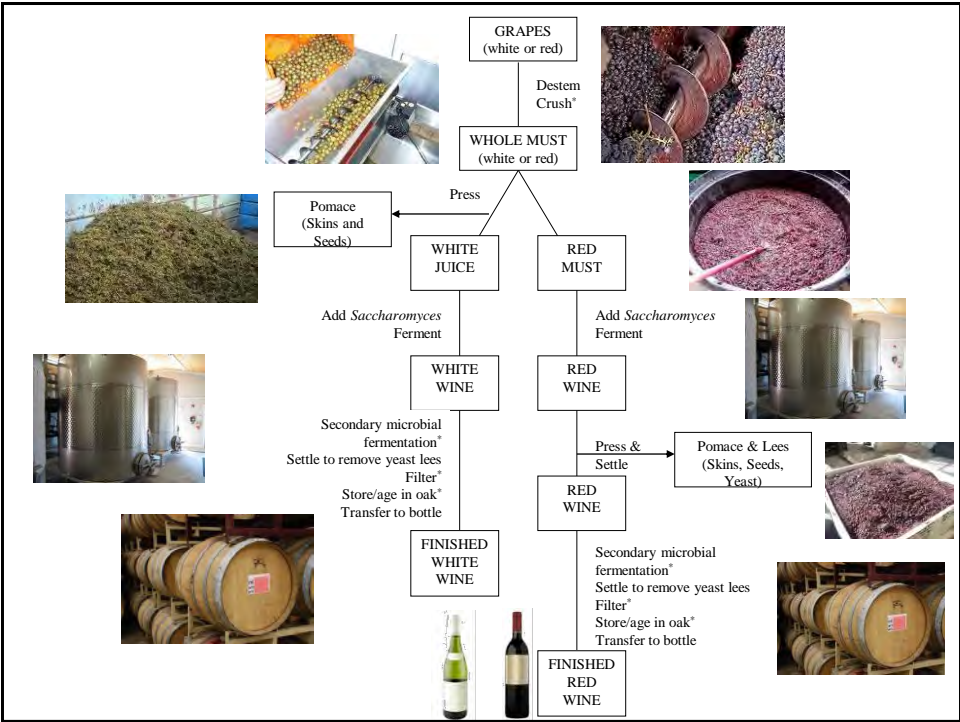
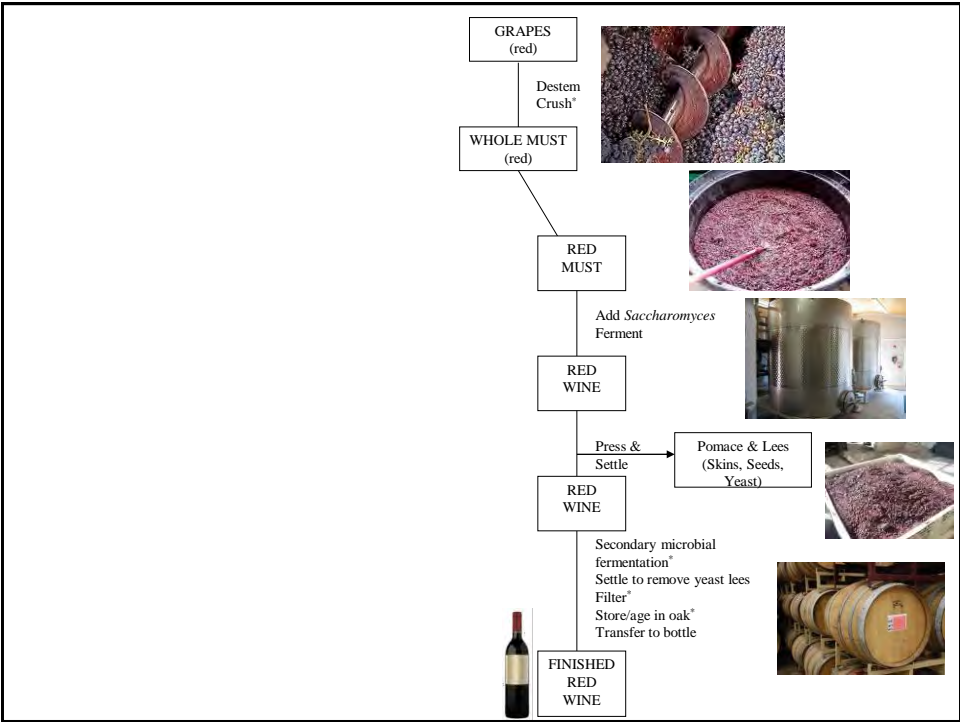




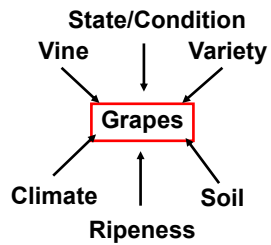






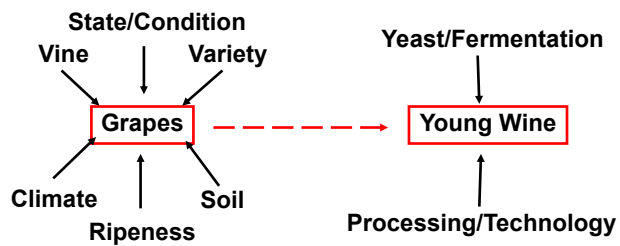


Wine Chemistry and Flavor



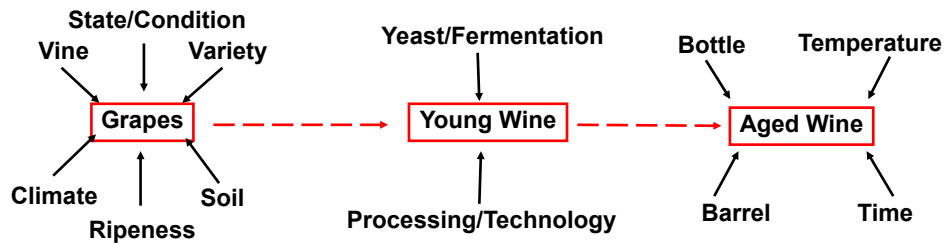
Adapted from Schreier, CRC Crit Rev Food Sci Nutr, 12(1): 59-111 (1979)

Wine Chemistry and Flavor



Adapted from Schreier, CRC Crit Rev Food Sci Nutr, 12(1): 59-111 (1979)

Wine Chemistry and Flavor



Adapted from Schreier, *GRC Crit Rev Food Sci Nutr*, 12(1): 59-111 (1979)

Understanding Wine Flavor

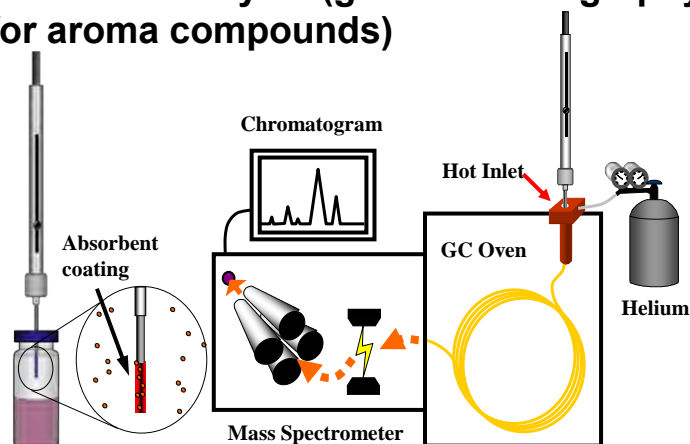
- ◆ **WHAT IS FLAVOR?**
- ◆ **A perceptual construct comprised of multisensory inputs:**
 - ◆ **Taste**
 - ◆ **Aroma**
 - ◆ **Color**
 - ◆ **Texture/Mouthfeel**

Understanding Wine Flavor

- ◆ What flavor compounds are present and how much?
- ◆ How do these compounds impact sensory properties? Individually and as complex mixtures?
- ◆ How do viticultural, winemaking practices effects grape/wine?

How do we measure flavor?

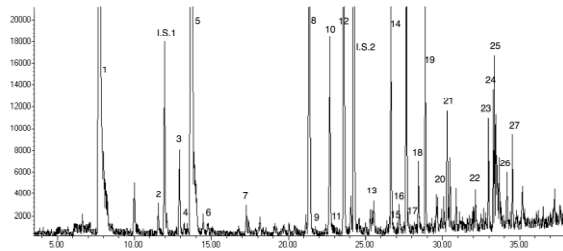
- ◆ Chemical analysis (gas chromatography for aroma compounds)



N. Lloyd, 2010

How do we measure flavor?

◆ Chemical analysis--Cabernet Sauvignon grapes



Canuti et al., J. Chromatogr. A (2009) 1216: 3012-3022

How do we measure flavor?

◆ Combine instrumental and sensory information

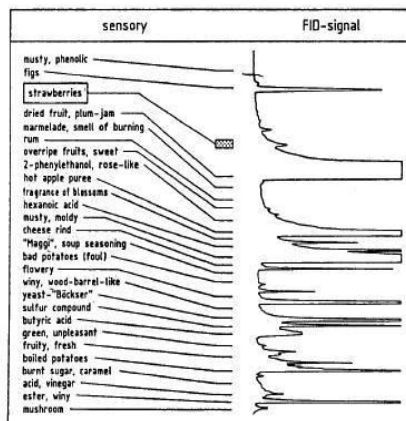
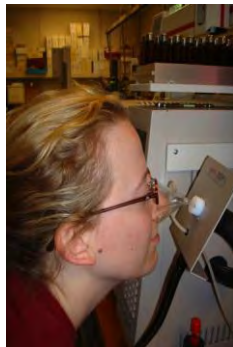
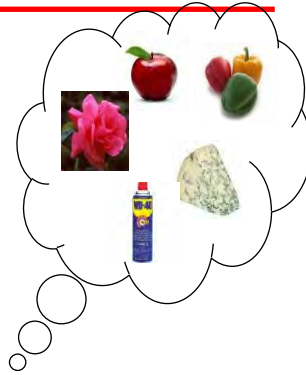


Fig. 18. Section of a "sniff"-chromatogram of an aroma extract of a grape variety with a typical strawberry-like flavour (cultivar: Pollux)

Rapp, 1988, *Wine Analysis*, Linskens and Jackson, Eds, Springer, Berlin

How do we measure flavor?

- ◆ **Sensory Analysis**



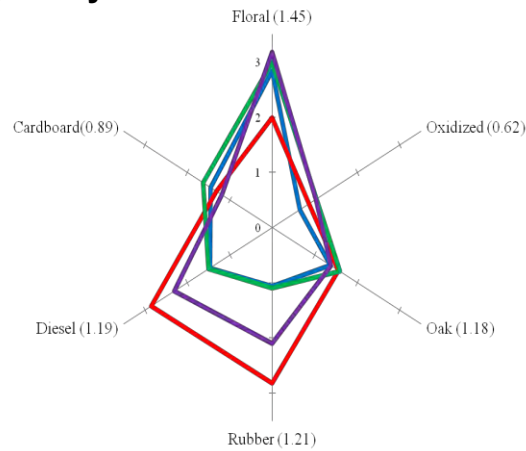
How do we measure flavor?

- ◆ **Sensory Analysis**
- ◆ **Controlled conditions**
(light, temperature, serving conditions, etc)
- ◆ **Requires panelist training**
- ◆ **Human becomes an analytical “instrument” to provide information about sensory attributes**



How do we measure flavor?

◆ Sensory Analysis



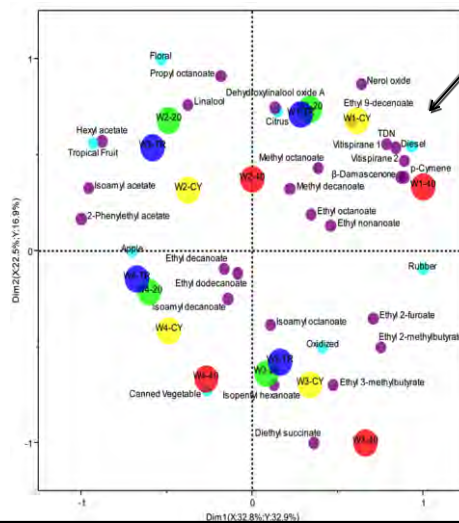
Riesling

Robinson et al.,
Am J. Enol. Vitic. 2010,
61: 337-347

Increased temp. → increased diesel & rubber

How do we measure flavor?

◆ Statistics to relate chemical and sensory information

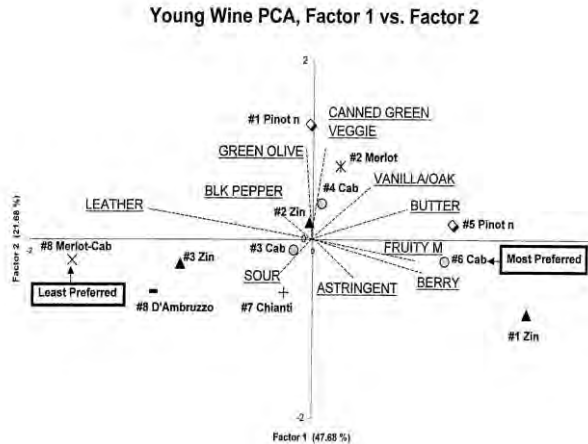


Riesling

Robinson et al.,
Am J. Enol. Vitic. 2010

How do we measure flavor?

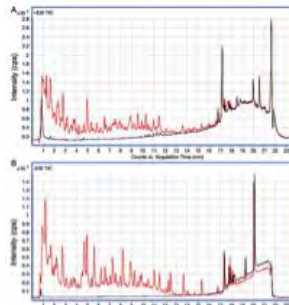
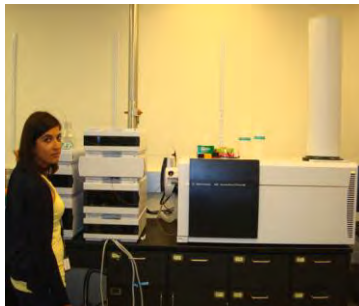
- ◆ Linking to consumer preferences



Ebeler, 1999 (courtesy of Dr. Ann Noble), *Flavor Chemistry: Thirty Years of Progress*, Teranishi et al. Eds., Kluwer, New York

New Tools to Measure Chemical Composition

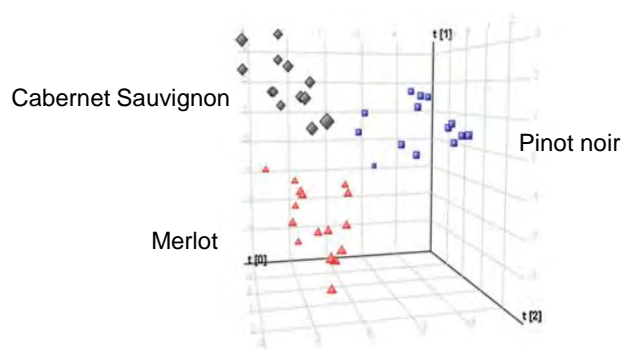
- ◆ Nonvolatile compounds-HPLC-TOFMS
- ◆ Measure hundreds of compounds with exact mass information
- ◆ Identify new compounds
- ◆ Chemometrics to classify sample groups



Vaclavek et al. 2011, *Anal. Chim. Acta*, 685: 45-51

New Tools to Measure Chemical Composition

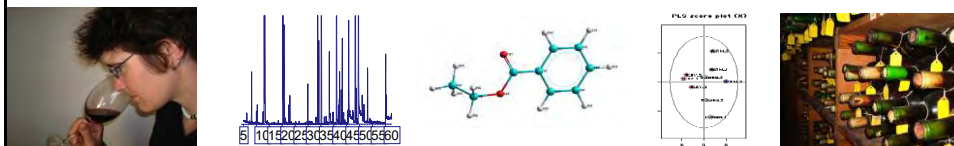
- ◆ Can we measure differences in wine composition?



Vaclavek et al. 2011, Anal. Chim. Acta, 685: 45-51

Summary

- ◆ Wine chemistry and flavor are complex.
- ◆ Use chemical and analytical tools to identify and quantify compounds.
- ◆ Use sensory tools to relate compositional information to sensory properties/attributes.
- ◆ Use these approaches to study viticultural, winemaking, storage, etc. effects on flavor (chemistry and sensory).
- ◆ Relate to consumer preferences.



Studying Viticulture & Enology at UC Davis

- ◆ <http://wineserver.ucdavis.edu>
- ◆ B.S. in Viticulture and Enology
- ◆ M.S. in Viticulture and Enology
- ◆ PhD in Various Disciplines (Agricultural Chemistry, Food Science, Microbiology, Plant Biology, Horticulture, Genetics, Engineering, etc.....)
- ◆ Certificate in Winemaking for Distance Learners
<http://extension.ucdavis.edu/unit/winemaking/certificate/winemaking/>
- ◆ University Extension 1- and 2-Day Shortcourses
<http://extension.ucdavis.edu/index.asp>

References/Information Sources

- ◆ Principles and Practices of Winemaking, Boulton et al., Chapman & Hall, 1996 (ISBN 0-412-06411-1)
- ◆ Chemistry of Wine Flavor, Waterhouse & Ebeler, American Chemical Society, 1998 (ISBN 0-8412-3592-9)
- ◆ Authentication of Food and Wine, Ebeler et al., American Chemical Society, 2007 (ISBN 978-08412-3965-4)
- ◆ Polaskova et al., *Chemical Society Reviews*, 2008, 37: 2478-2489, DOI: 10.1039/b714455p
- ◆ Ebeler and Thorngate, *J. Agric. Food Chem.*, 2009, 57: 8090-8108, DOI: 10.1021/jf9000555
- ◆ *Journal of Agricultural and Food Chemistry*
- ◆ *American Journal of Enology and Viticulture*



Q&A Session



Advances and Innovations in Wine Chemistry



Susan Ebeler,
University of California, Davis



Bill Courtney,
Cheese-ology,
St. Louis, MO

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