

Enology and Viticulture Program Newsletter



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More Research On Wine & Health

Jimmy Keeton
Department Head, Nutrition and Food Science, Texas A&M University



Wine and other alcoholic beverages have been consumed for thousands of years and studies have shown that the mortality rate in men due to ischaemic heart disease is lower in countries with higher rates of wine consumption (i.e. France, Italy) (St. Leger et al. 1979). It has been shown that excessive alcohol consumption (>2.5 drinks per day for women; >4 drinks per day for men) increases the relative risk

of total mortality and is detrimental to health (DiCastelnuovo et al. 2006, Djousse et al. 2009), but small to moderate levels have been shown to have beneficial effects and reduce the relative mortality risk. Recent epidemiological studies conducted in Northern California (Klatsky et al. 2003) indicate that the risk of mortality from coronary artery disease is reduced by consumption of 1-2 servings of wine per day. Moderate consumption of both beer and liquor has been shown to have some protective effect, but wine appears to be the most beneficial. Red wine is high in phenolic compounds, which are natural antioxidants, and resveratrol which in high doses has been shown to improve longevity and overall health of mice fed a high-calorie diet. The phenolic concentration in wines differ depending on grape varieties used to make the wine and typically white wines have lower levels of phenolic compounds.

The lower mortality risk associated with moderate wine consumption may be due in part to moderate drinkers selecting healthier foods (fruits, vegetables, olive oil, low-fat products, etc.) similar to those recommended in the Mediterranean diet and following a healthier lifestyle that in turn improves cardiovascular health. The Mediterranean diet recommends one 5-oz glass of wine per day for women and two for men. Similarly, recommendations in the USDA Dietary Guidelines state that "alcoholic beverages should be consumed sensibly and in moderation which is defined as one drink per day for women and up to two drinks per day for men." Several

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Does Being "Green" Have You Singing the Blues?

Michael Sipowicz
Enology Program Specialist- Extension Agricultural Research & Extension Center



By now most Texas winemakers are breathing a sigh of relief as yet another harvest is in the rear view mirror. As discussed in our last newsletter, Texas Harvest 2009 was not without its challenges. If you were among the fortunate ones to receive the exact quantity and quality of fruit that you had hoped for at the start of the year, you are in a very small minority. Harvest 09' came and went and

most of us, growers and winemakers alike, were a bit disappointed. I suppose no one said growing grapes and making wine in Texas would be easy.

For those of you who read our last newsletter, you may recall that I gave a few suggestions as to how one might deal with asynchronous ripening and those "green" undesirable flavors in our reds. Perhaps as a result you tried some new harvest processing techniques this year, or perhaps in hindsight you now wish you had. Harvest is over. Your ability to choose a yeast which may reduce pyrazines is now a lost opportunity. Your chance to try Delestage or short vatting, a thing of the past. While your opportunity to alter harvest and fermentation processing has obviously passed, there are still a few things that you can do now to help mitigate the effects of less-than-mature flavors in your wines.

Methoxypyrazines, specifically IBMP (2-methoxy-3-isobutylpyrazine) in wine, can impart excessive herbaceousness and vegetal aromas. IBMP affects wine aromatics as well as mouth feel, reducing "fruit intensity" and negatively impacting palate structure/texture. The impact of this compound is accentuated in the presence of Sulfur-Like Off Odors or SLO. It is therefore reasonable to conclude that you have the ability to lessen unwanted "green" aromas and flavors by eliminating/reducing SLO. How does one eliminate SLO? The first step is to run sulfide detection bench trials. I know what some of you are saying, "I do NOT smell sulfidic odors in my wine, why run trials?" The answer is simple. Even if the SLO is near or below your sensory threshold, it still has the ability to mute positive wine aromatics or increase your perception of herbaceous and veggie aromas. Unless you perform these trials on ALL your wines (the earlier the better), you will not have the benefit of a "before and after" (copper treatment) comparison. You have much to gain and nothing (a few dollars and a few minutes) to lose. The trials are very fast, easy and inexpensive. It almost NEVER fails.

After discussing "shop" with the winemaker, I suggest that we run some sulfide detection bench trials. We grab some wine from the tasting

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Change to Viticulture Extension

Dr. Ed Hellman, Viticulture Extension Specialist

Dr. Doug Welsh, Associate Department Head-Horticulture

We are pleased to announce a change in organizational structure of AgriLife Extension's Viticulture Extension Team. To enhance management of the Team and increase the effectiveness of our programs to serve the needs of the grape and wine industry, Fritz Westover has been promoted to Extension Program Specialist-Viticulture, beginning October 15th. Fritz will continue in his Viticulture Advisor role for the Gulf Coast, while taking on his new statewide duties. As Program Specialist, Fritz will provide coordination and supervision of the Extension Viticulture Team comprised of three Extension Associates-Viticulture, plus himself. We feel this change is a logical evolution of the Viticulture Extension Program that will provide enhanced responsiveness to grower needs. The Viticulture Extension Team will be supported by Ed Hellman, who serves as Fritz's supervisor and continues to provide overall leadership for the Viticulture Extension Team, and Jim Kamas, who continues to serve as Outreach Coordinator for the Texas PD Research & Education Program.

With this change in place, AgriLife Extension is now actively seeking to fill the West Texas Extension Associate-Viticulture (Viticulture Advisor) position. We are looking for the very best candidate for a position that requires a talented, experienced viticulturist who will be fully engaged with the wine grape industry throughout the West Texas region. If you are aware of potential candidates, please let us know.

As always, we welcome and encourage your comments and suggestions about the Viticulture Extension Program.

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Fritz Westover (left) discussing pruning with Gulf Coast grape producer Jerry Watson.

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room and head to the lab area. I quickly pour some trial portions and add treatments to each. After a few minutes we evaluate the wines. First I see the look of SHOCK in the winemaker's eyes..."WOW!... the treated wine smells incredible!(compared to the untreated)" Then comes the look of despair when the novelty of the procedure wares off and the realization of lost potential sets in. The wine that we performed trials on was already bottled. Ahh, what might have been.

As SLO will reinforce the impact of Methoxypyrazines in wine, that which will minimize SLO will thus minimize the perception of herbaceous green aromas/flavors. Oxidation of certain sulfur containing compounds through the processes of microoxygenation, "rack-splash" or "splash" operations will minimize their olfactory influence over the wine. Additionally, as previously noted, such an effect can be permanently attained by running sulfide detection bench trials followed by appropriate copper sulfate addition protocol.

Another possible treatment for wines which suffer under the burden of harsh, green aromas and herbaciousness is the use of polysaccharides. Polysaccharides may be increased in a wine through the use of the various yeast-derived mannoprotein products available. The positive palate structure and aromatic effects of sur lie aging of white wines have been known for a long time. Yeast fining and sur lie aging of red wines is recently gaining favor as a way to increase palate structure and wine aromatics, thus mitigating the effects of pyrazines. Sur lie aging, the use of certain ML bacteria strains, oak or oak product additions, gum Arabic (Arabinol), yeast fining as well as many other commercial products offer different ways to increase wine polysaccharides and sugars.

While there is not yet solid research consensus regarding oak's ability/inability to "bond" with pyrazines, there is much anecdotal evidence suggesting that oak additions early in a wines life seems to minimize herbaceous and veggie aromas/flavors. Perhaps this has more to do with pyrazine aromas being "buried" within an oak aromatic profile than it has to do with some pyrazine-oak reaction. Interestingly contrary to this popularly held belief are the findings of G. Stanley Howell, et al in *Cellar Methods to Reduce Methoxypyrazine Levels in Cabernet franc & Cabernet Sauvignon Wine*, 2006. While there appeared to be some unknown variability during replications, their report suggests that IBPM concentrations actually may increase as the rate of French Oak chip additions increase!

Thermal treatment has been reported to reduce the perception of herbaceousness in treated wines. Dr. Bruce Zoecklein, Head, Enology-Grape Chemistry Group, Virginia Tech, suggests this is perhaps due to chemical or volatility changes, including oxidation. Anna Katharine Mansfield reported in *The effects of post-fermentation and post-bottling heat treatment on Cabernet Sauvignon (V. vinifera L.) Glycosidases*, 2001, that there is a positive correlation between heat-treated wines and an increase in glycosidic aroma and flavor compounds and increased pigment polymerization. The increase in these aroma and flavor compounds will further reduce the perception of herbaceousness. For this study, wines were held after bottling at 42°C for 21 days.

Blending a flawed wine with a non-flawed wine is probably the most common remedy to bring a flaw below sensory threshold. If you can't find a way to blend it (the flaw) away with a wine you currently have, you could buy a blending wine from the bulk market. A final option, if all else fails and you refuse to "put your label on it"... you can ALWAYS sell it on the bulk market. Did I mention to be careful of buying on the bulk market?

For more information regarding any of the materials covered herein, please contact Mike Sipowicz at mipsipowicz@ag.tamu.edu

Texas Tech University Viticulture & Enology Program Update

Brent Trela, PhD. Texas Tech University



This fall, Texas Tech began offering courses in winemaking, viticulture and wine tourism as well as a new degree specialization in viticulture and enology, a first for Texas universities. The first enology course is a wine appreciation introduction to grape cultivars and wines of the world and their production. There are currently 33 students enrolled. The follow-up courses Wine Production Introduction will be offered during Winter Semester. Two more courses,

Wine Quality Control and Analysis; and Winery Business, Planning, Design and Operations are being developed for subsequent semesters.

Along with teaching these new courses, I am working to make these courses available in the future as a distance option so that folks across the state can participate in these or similar classes in their workplace or from the comfort of their own home. As part of this a new website will soon be launched called Texas Enology Network (TEN) with the intent to provide a modern, cost effective, and dynamic enology outreach program. This site will be linked at the hip with the current Texas Winegrape Network (TWN, <http://winegrapes.tamu.edu/>) and the interface between the two sites and Viticulture and Enology will be seamless. The creation of TEN aims to:

- Be a single site resource for accurate information on a broad array of topics of interest to Texas enologists and winemakers
- Organize available information from multiple institutions at one location
- Provide a resource for continuing education programs
- Serve as an interactive site for real-time problem solving
- Provide documented training in various areas
- Provide timely and topical information on current issues
- Allow innovative uses of existing and developing communications technologies

On a larger scale, TEN and TWN may also form part of a regional virtual viticulture and enology institute, pulling together and making more accessible, more informational resources for the Texas wine industry.

We are also at work developing a winery startup and operations model that will analyze a users input variables to help predict winery business startup and forecasting costs, required resources and provide risk analysis. This is a long term project, but we hope to have a simple cost planner available by the end of the year. We are excited to help support and further the Texas wine industry.



Students in TTU PSS 1311 Winemaking World-Wide Class tour Llano Estacado Winery

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studies have suggested that moderate consumption of wine lowers the risk of type 2 diabetes and stroke, improves cognitive function, and increases bone density.

Overall, multiple clinical studies with wines demonstrate the immense health benefits associated with a moderate consumption and many Americans consume wine based on their health benefits.

As it has happened with other healthy foods, isolated negative reports may cause many consumers to turn away from a healthy habit. For example, a recent epidemiological study of middle-aged women in the United Kingdom (Lauer and Sorlie 2009) indicates that low to moderate consumption of any type of alcohol might increase the risk of several types of cancer, especially breast cancer, which is in contrast to many performed studies and our research performed by Dr. Susanne Talcott, in the Department of Nutrition and Food Science at Texas A&M University and sponsored by TDA indicates that extracts from port and syrah wines contain natural components that actually inhibit growth of colon and breast cancer cells. Based on these findings, she is conducting additional studies to further demonstrate the anti-carcinogenic effect of wine components present in Texas red wines. This health-related research is critically important because it defines the true effect of wine components and their contribution to a healthy life and sends a clear message to consumers and the wine and grape industry.

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*"On a sad note, we would like to wish a fond farewell to our friend Reams Shofner, and our heartfelt condolences to his family. Reams was born September 21, 1935 and passed from this life on October 4, 2009. I took this picture during our last meeting as I collected research samples while he and his family harvested their 2009 grape crop. He will be missed."
~Mike Sipowicz*



Post-Harvest Conditions for Grapes

Susanne Talcott, Ph.D.



Post-harvest conditions and grapes typically are not named within the same sentence, but due to climate and long-transport routes in the state of Texas, grape quality can be significantly altered after harvesting, also significantly influencing the wine-making process. In addition to further investigating health-benefits of Texas wines, we currently are investigating the effects of post-harvest conditions on grape (Merlot and Black Spanish) quality and different methods on how to overcome some of the difficulties associated with temperature and transport, but also with methoxy-pyrazines, which typically are present in grapes after a late freeze due to uneven ripening. We are looking forward in working with the Texas wine industry and Mike Sipowicz in developing feasible strategies in this research applicable to small and larger wineries.

Texas Enology Network Launches New Website

Texas Enology Network www.texasenology.org (the companion site to Texas Winegrape Network) is expected to launch on December 25th, 2009. This website is a joint venture between Texas Tech University and Texas A&M University/Agrilife Extension and will be specific to enology and winemaking. Be sure to check it out for up to date information on Texas enology extension, education and research activities and materials.



The wine and grape research and extension team would like to wish everyone a Merry Christmas and Happy Holidays. We hope you have a wonderful start into the New Year.

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Enology, Wine Chemistry, and Health Benefits

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