Tasting Healthier Wines

THEY DO EXIST, DON’T THEY?
Society of Wine Educators
43rd Annual Conference
Washington, DC

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Undiagnosed Middle-Age-Onset Discomfort
Summer Tour T-shirt
Cartoon by DKO
That Other 5%

Red Wine Composition, Minor Components

- Acetaldehyde
- Volatile Acidity
- Sugar
- Phenols
- Minerals
- Esters
- Amino acids
- Acid
- Higher Alcohols
- Sorbitol & Mannitol
- Sulfites
- Glycerol

Waterhouse.ucdavis.edu
Basic Definitions

Macronutrients

Micronutrients

“Other”
Definitions

- **Phytochemical**
  - Chemical produced by plants

- **Polyphenol**
  - Compound with > 1 phenol group
  - ‘Phenolics’

Cartoon: Bor—ing

[Diagram of phenol groups](Shutterstock.com | 630700160)
3 Polyphenol Families

- **Flavonoids – 3 rings**
  - 5,000 compounds
  - 6 major subclasses
  - Citrus, tea, chocolate

- **Non-flavonoids – 2 rings**
  - **Stilbenes**
    - Seeds, legumes, pomegranate
  - **Phenolic acids – 1 ring**
    - Coffee, vinegar, strawberries
Polyphenols

- Phenolics: antioxidant, anti-cancer, antimicrobial
- Stilbenes: antioxidant, anti-inflammatory, cardioprotective, anti-cancer, anti-diabetes
- Flavonoids: antioxidant, heart-protective, anticancer, anti-inflammatory, antimicrobial
Flavonoid Subclass Structures

https://lpi.oregonstate.edu/mic/dietary-factors/phytochemicals/flavonoids
Polyphenols

- Phenolic acids
  - Hydroxycinnamic acids
    - Examples: caffeic acid
      - Main food sources: strawberries, coffee
  - Hydroxybenzoic acids
    - Examples: gallic acid
      - Main food sources: areca nut, vinegar
  - Stilbenes
    - Examples: resveratrol, viniferin
      - Main food sources: grapes, red wine
  - Lignans
    - Examples: pinoresinol
      - Main food sources: flax seed, sesame seed
  - Tannins
    - Examples: tannic acid
      - Main food sources: pomegranate, legumes
- Non flavonoids
  - Flavones
    - Examples: flavone, luteolin
      - Main food sources: celery, parsley
  - Flavonols
    - Examples: quercitin, kaempferol
      - Main food sources: apple, broccoli
  - Flavanones
    - Examples: naringin, butin
      - Main food sources: citrus fruits
  - Flavanols
    - Examples: catechins, EGCG
      - Main food sources: tea, chocolate
  - Isoflavones
    - Examples: genistein
      - Main food sources: soybean, fava bean
  - Anthocyanins
    - Examples: cyanidin
      - Main food sources: onion, berries
Polyphenols = Terminators

- Defense chemicals
- Insects, animals, microbes
- UV radiation
- Nontoxic to humans
- Polyphenol content in wine

→ taste profile, organoleptic

www.slideshare.net/NAGINAFATIMA/plant-phenolic-compounds/9
Influencers

- Threats
- Temperature
- Sun exposure
- Water stress
- Geology / soil
- Fertilizers
- Maceration
- Fermentation
- Aging / wood

Cardi B, Instagram via www.numero.com
No-Arrow Zone

Smoking seriously harms you and others around you

Smoking kills

Smoking kills
Survey of the Free and Conjugated Myricetin and Quercetin Content of Red Wines of Different Geographical Origins

Morag S. McDonald,† Mark Hughes,† Jennifer Burns,† Michael E. J. Lean,§ David Matthews,§ and Alan Crozier*,†

Differences in the amount and structure of extractable skin and seed tannins amongst red grape varieties

F. Mattivi, U. Vrhovsek, D. Masuero and D. Trainotti

Antioxidant Capacities and Phenolics Levels of French Wines from Different Varieties and Vintages

Nicolas Landrault,† Patrick Poucheret,‡ Patrice Ravel,‡ Francis Gasc,† Gérard Cros,‡ and Pierre-Louis Teissedre*,†

Flavonol composition of Australian red and white wines determined by high-performance liquid chromatography

D.W. Jeffery, M. Parker and P.A. Smith
A Global Survey of Trans-Resveratrol Concentrations in Commercial Wines

DAVID M. GOLDBERG1*, JOE YAN2, ERIC NG2, ELEFTHERIOS P. DIAMANDIS1,3, ALEX KARUMANCHIRI2, GEORGE SOLEAS4, and ANDREW L. WATERHOUSE5

Phenolic composition and magnitude of copigmentation in young and shortly aged red wines made from the cultivars, Cabernet Sauvignon, Cencibel, and Syrah

Isidro Hermosín Gutiérrez a,*, Eva Sánchez-Palom Lorenzo b, Almudena Vicario Espinosa b

Characterisation and evolution of grape polyphenol profiles of Vitis vinifera L. cv. Tannat during ripening and vinification

E. Boido1, M. García-Marino2, E. Dellacassa3, F. Carrau1, J.C. Rivas-Gonzalo2 and M.T. Escrivano-Bailón2

Variation in Condensed Tannin Content, Composition and Polymer Length Distribution in the Skin of 36 Grape Cultivars

Mark O. Downey1*, Marica Mazza1, Tara J. Seddon1,2, Simone Rochfort3 and Mary Millikan2
Do Not Underestimate The Force
Mazzoni, Nebbiolo “Del Monteregio”, Colline Novaresi (Piemonte), DOC 2016

- 100% Nebbiolo
- DOC 1994
- Volcanic; gravel, clay, sand
- Practicing organic
- 500 L tonneaux (used) X 1 yr
- 13% ABV
- > 2020 drinking window
Alto Piemonte

http://www.skurnik.com/alto-piemonte-region-rise/
364-day, all-occasion Nebbiolo

Gentle lift of happy, aromatic ‘Alto Piemonte’ (Ghemme hills)

Gattinara, Lessona, Boca, Bramaterra, Fara, Sizzano (Alps)
Willamette Valley Vineyards, Whole Cluster Pinot Noir, Willamette Valley, Oregon 2017

- Pinot Noir, Clone 114, 115, 667, 777, Pommard and Wädenswil
- Jory and Nekia (iron rich volcanic), Nekia, Laurelwood (wind blown, glacial loess) including Pisolites and Missoula Flood sediment
- 13.5% ABV
- Carbonic maceration
- Whole cluster fermentation in stainless steel tanks, 7–10 days
- 55,000 cases
- Peak drinkability 2018 - 2022
Resveratrol = 10.1 micromoles / L

- TTB 2002
- Whole cluster > highest
- Whites ~ ¼ of reds
- ~ 0.1 to 2.6 mg/L*
- clinicaltrials.gov : 123

* Romanian wines, 2014
Resveratrol in Action

- Dose, matrix, size, biome, time of day
- ≥ 1 g / day
- 👍 antioxiandant, neuro inflammation
- 👍 diabetes, heart/lining, inflammation

Den Hartogh DJ and Tsiani D. Nutrients 2019, 11, 1624.
Cantine Lonardo Taurasi DOCG
Aglianico, Campania, Italy 2012

- 100% Aglianico
- 1,200 feet / 400 meters
- Limestone & volcanic marls
- ~ 1 month maceration
- 20–50 year-old vines
- Aging:
  - 18 mos used tonneau
  - 6 mos stainless steel
  - 12 mos bottle
‘Barolo of the South’

- Taurasi DOCG 1993
- Etruscan, Hellenic or native?
- Roman Empire
- 3 biotypes: Taurasi, Taburno, del Vulture
- Thick skinned, slow ripener
- US 1988 (Paso Robles, Caparone)
- Floral, firm, mineral, acid, tannin, depth of flavor, smoky, spicy
- ‘Wine railroad’ to the North
Bolivia

- Potosí: 1630 > London
- 1930s: French, Singani
- 1960s: Argentine tech
- 1999: First Tannat, Tarija
Elbow of The Andes

- Landlocked
- World's highest altitude vines
- Latitude: 17° – 22° South
- ~ 3X Montana, ~ 11 million people
- Winemaking x 400 years
- Singani, Muscat de Alexandria
Santa Cruz Valleys

- 1600 – 2300 meters (4800 – 6900’)
- 300 hectares (80K capacity)
- ~ 24” annual rainfall
- 18° – 19° latitude south
- Samaipata, Uvairesneda: quality wines

winesofbolivia.com
Vinos1750, Bodega Uvairesenda Samaipata, Bolivia 2016

- Guaraní native artwork
- 5741 – 6890 feet
- 100% Tannat
- Sandstone, schist
- SS fermentation, no oak
- 14%
- WM: Francisco Roig
Roger Corder: Procyanidin Man

The Red Wine Diet
Drink wine every day and live a long and healthy life
Roger Corder

A Complete Nutrition and Lifestyle Plan
Drink red wine every day
Eat fruit and berries, nuts and chocolate
Enjoy a longer, healthier life
ROGER CORDER

Groundbreaking.
The Daily Telegraph (UK)
Longevity & Endothelium

Terroir of Longevity

- OPC: oligomeric procyanidins
- Endothelin-1
- Pips (seeds) main source
- 3+ wks ferment + maceration
- Nuoro & Gers wines: 2–4 X biologic activity and OPC content

Tannat

- SW France (Gers, Madiran)
- Richest tannin content
- Pips, skins: tannins; skins: anthocyanins
- High phenols, polyphenols
- Resveratrol > PN, Merlot, Cabernet
- Genes → enzymes → tannins

naturalmerchants.com/organicwines/varietals/organic-tannat/
Polyphenol-Rich Grapes

High Tannins
- Tannat
- Sagrantino
- Malbec
- Aglianico
- Petite Sirah
- Cabernet Sauvignon

High Anthocyanins
- Tannat
- Alicante Bouschet
- Souzao
- Petite Sirah
Anthocyanin & Tannin Extraction

- Pectolytic enzymes
- ↑ fermentation temperature
- Thermovinification (flash détente)
- Saignée
- ↑ frequency, duration of punch-downs
- Extended maceration
- Must freezing (cryo-maceration, CM)
Texas Wine Country

- Texas High Plains AVA, 1993
- Amarillo, Lubbock +
- 33.5° N, 102.1° W
- 4,000 acres
- Elevation 3,500 feet
- 85% of TX wine grapes
- Semi-arid, 17-21” rainfall
- Sedimentary, eolian: sandy, loam
Bending Branch Winery Tannat CM
Newsom Vineyard, Texas High Plains 2014

- Cryo-maceration
- American oak, 36+ months
- 14.2%
- 94 cases
- Robert W Young, MD, winemaker
Flash Détente

- Thermoflash, flash release
- 1990s, south of France
- Must rapidly heated 185°F / 85°C
- Vacuum chamber > cooling
- Color, tannin extraction
- Skins & vacuoles > seeds
- Release aromatics
- Removes ‘air-oir’, laccase, pyrazines
Quality Outcomes – Flash

- ↑ Anthocyanin, tannin extraction (~ 20 – 50%)
- ↑ Fruit flavor expression
- ↓ Undesirable aromatics, flavors
- ↑ Brix (~ 1–5%)
- Fruit rescue (under-ripe, rot)
- ? Dampen varietal character
Grape Phenolic Extraction

CRYO-MACERATION

- Skins and seeds
- Tannins > Anthocyanins

THERMOVINIFICATION

- Skins primarily
- Anthocyanins > Tannins
The Wine Doctor Shiraz
Barossa Valley, 2016

- 100 mg / L resveratrol
- Philip Norrie, MD
- "World's healthiest wine"
- 2006, patent 2008
- 14%
Helps you die young, as late as possible

– Dr. Philip Norrie

- Australia’s Wine Doctors, 1986
- 2006 Shiraz, 2008 Chardonnay
- ResElixir 30 ml bottles
- Maroon Wines, Napa
- Charities Ethiopia, Australia
An antioxidant in red wine might power astronauts on Mars, study says

By Ashley Strickland, CNN

Updated 12:02 AM ET, Thu July 18, 2019
Trinchero Forte Red Wine
Napa Valley 2014

- Mostly Malbec
- Rest = PV, CF, PS
- Atlas Peak (Haystack Vyd)
- ~ 1,500’, Vaca Mtns
- Volcanic, porous > acidity
- Cloud’s Nest Vyd (Mt. Veeder)
- Napa–Sonoma boundary, 2,700’
- 14.9%
Trinchero Cloud’s Nest Petit Verdot
Mt. Veeder, Napa Valley 2014

- 100% Petit Verdot
- Mt. Veeder, Mayacamas
- Gravelly sandstone & shale
- Cool, eastern exposure
- 20 months, 100% French oak
- 14.6%
That Mountain Thang

- Low night temps → anthocyanins
- Elevation, UV → anthocyanins
- Water stress → anthocyanins, PAs
- Temps > 25°C / 77°F → max poly
- Small berries, thicker skins
- Low-level nutrients, minerals → anthocyanins & phenolics
Ehlers Estate Cabernet Sauvignon
St. Helena, Napa Valley 2016

- 88% Cabernet Sauvignon, 12% Merlot
- 2008: Certified Organic (CCOF)
- Contiguous 42-acre estate vyds
- Napa’s narrowest point
- WM Laura Díaz Muñoz
- Near-perfect vintage
- Loamy bench soils
- 14.5%
- 1,800 cases
History

- Bernard Ehlers, 1880s
- 1990s Jean and Sylviane Leducq
- 1995 replantings, enologist Jacques Boissenot
- Bordeaux varietals (CS, CF, Merlot, PV, SB)
- 1996: Leducq Foundation
Blue Wine?
Alcohol Consumption in Later Life and Mortality in the United States: Results from 9 Waves of the Health and Retirement Study

Katherine M. Keyes, Esteban Calvo, Katherine A. Ornstein, Caroline Rutherford, Matthew P. Fox, Ursula M. Staudinger, and Linda P. Fried

Background: Alcohol consumption in later life has increased in the past decade, and the relationship between alcohol consumption and mortality is controversial. Recent studies suggest little, if any, health benefit to alcohol. Yet most rely on single-time point consumption assessments and minimal confounder adjustments.

Methods: We report on 16 years of follow-up from the Health and Retirement Study (HRS) cohorts born 1931 to 1941 (N = 7,904, baseline mean age = 61, SD = 3.18). Respondents were queried about drinking frequency, quantity. Mortality was established via exit interviews and confirmed with the national death index. Time-varying confounders included but were not limited to household assets, smoking, body mass index, health functioning, depression, chronic disease; time-invariant confounders included baseline age, education, sex, and race.

Results: After adjustment, current abstainers had the highest risk of subsequent mortality, consistent with sick quitters, and moderate (men: HR = 0.74, 95% CI: 0.60 to 0.91; women: HR = 0.82, 95% CI: 0.63 to 1.07) drinking was associated with a lower mortality rate compared with occasional drinking, though smokers and men evidenced less of an inverse association. Quantitative bias analyses indicated that omitted confounders would need to be associated with ~4-fold increases in mortality rates for men and ~9-fold increases for women to change the results.

Conclusions: There are consistent associations between moderate/occasional drinking and lower mortality, though residual confounding remains a threat to validity. Continued efforts to conduct large-scale observational studies of alcohol consumption and mortality are needed to characterize the changing patterns of consumption in older age.

Key Words: Alcohol Consumption, Older Adults, Health and Retirement Study, Mortality, Moderate Drinking.
Alcohol & Mortality

- 8,000 US adults > 56, ~ 15 yrs
- Time & other confounders
- Smokers, M < nonsmokers, F
- Risk varies for some

NEWS RELEASE

One in 10 Older Adults Currently Binge Drinks

Jul 31, 2019
Modified Jul 31, 2019

Men, Cannabis Users More Likely to Engage in This Risky Behavior

More than a tenth of adults age 65 and older currently binge drink, putting them at risk for a range of health problems, according to a study by researchers at NYU School of Medicine and the Center for Drug Use and HIV/HCV Research (CDUHR) at NYU College of Global Public Health.

The study, published in the Journal of the American Geriatrics Society, also finds certain
Moderation: In the Eye of the Beholder?
Sober Curious

- "Mindful drinking"
- ‘Temporary temperance’
- Hip sobriety, the New Black
- #soberissexy
- 12-step alternatives
- Nonalcoholic beverages
Want to live longer? Drink alcohol, new study says
– USA Today, July 13, 2019

But what American cities are spending the most on alcohol?

Average amount a person spent on alcohol: $1,112

Video source: JAMA
Synergy, Baby

Ellagic acid
piceid
Proanthocyanins
Anthocyanins
catechins
Melatonin
Hydroxytyrosol
Caffeic acid
Resveratrol
Quercetin
5 Healthy Habits = 10+ Years

- No smoking
- Healthy weight
- Physical activity
- Quality diet
- Moderate alcohol

Li Y et al. Circulation. 2018;138:345-355
Mediterranean Drinking Pattern

- Meals, slowly
- Small amounts
- Other beverages
- Food rules
- Connection
- 1–2 non-drinking days / week

www.ganzomag.com
Food as Medicine

- Plant-based > meat
- Nuts, legumes, whole grains
- Olive oil rules
- Portion control
- Sharing and joy
- Alcohol in moderation
Wines & Websites

Mazzoni, Colline Novaresi Nebbiolo Del Montereigio, Piemonte, Italy, 2016
www.northberkeleyimports.com/wordpress/project/azienda-agricola-tiziano-mazzoni/

Willamette Valley Vineyards, Whole Cluster Pinot Noir, Willamette Valley, Oregon 2017
www.wvv.com

Cantine Lonardo Taurasi Aglianico 2012
www.polanerselections.com

Vinos1750, Bodega Uvaienda, Tannat, Samaipata, Bolivia 2016
www.vinos1750.com

Bending Branch Winery Tannat CM, Newsom Vineyard, Texas High Plains 2014
www.bendingbranchwinery.com
Wines & Websites (cont’d)

- The Wine Doctor Shiraz, Barossa Valley, Australia 2016
  - [https://maroonwines.com](https://maroonwines.com)
- Trinchero Forte Red Wine, Napa Valley 2014 &
- Trinchero Cloud’s Nest Petit Verdot Mt. Veeder, Napa Valley 2014
  - [www.trincheronapavalley.com](http://www.trincheronapavalley.com)
  - [www.tfewines.com](http://www.tfewines.com)
- Ehlers Estate Cabernet Sauvignon, St. Helena, Napa Valley 2016
  - [www.ehlersestate.com](http://www.ehlersestate.com)
“Whether wine is a nourishment, medicine or poison is a matter of dosage.”
– Paracelsus
(1493–1541)
Thank You!

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