



oeno-MAC approach for the French Paradox

Food Health and Safety

Conference organised by the

T.E.I. of Athens

11/06/2009

Athens - Greece

- ▶ **Leonardo da Vinci European programme support**
- ▶ **8 countries partners:**
 - ✓ B, E, D, F, GR, HU, TR and UK
- ▶ **Educational/Training dimension (→ EQF & ECVET)**
- ▶ **Training of trainers + Face to face trainings**
- ▶ **Transfer of technologies on health & process areas**
- ▶ **Exchanges of good practices**
- ▶ **Dissemination in national languages**

- ▶ **Vine cultivation**
- ▶ **Wine production**
- ▶ **Bottling**
- ▶ **Health, gastronomy and safety e.g.**
 - ✓ Resveratrol, flavonoids & antioxidants,
 - ✓ Wines and vine products from organic farming,
 - ✓ Elimination techniques for mycotoxins/ ochratoxin,
 - ✓ non-alcoholic beverages
 - ✓ “by-products” and cosmetology
- ▶ **Business development:**
 - ✓ Rural development & eco-tourism
 - ✓ Sustainable agri-products **(including by-products and health)**
 - ✓ Regulation changes with impact on business and its implementation

1. Diet aspect + lowest (N°2) heart diseases mortality
 1. saturated fat + other food
 2. Life + Consumption styles
(e.g. in F: mainly with meal)
2. (Red) Wine aspects:
 1. Alcohol compound
 2. Resveratrol
 3. Polyphenols & Procyanidins & Flavonoids
3. Supplementary aspect linked to wine:
 1. Vine variety & *Terroir*
 2. Wine process

French Paradox stats in short

- ▶ **Observation:** the French low incidence of coronary heart disease, despite relatively rich diet in saturated fats.
(first noted by Irish physician Samuel Black in 1819).
- ▶ **FAO data:** in 2002, fat from animal sources:
Average French: 108 g/d - Average American: 72 g/d.
- ▶ French: 4x butter, 60% more cheese and 3x pork.
- ▶ French: more total fat (171 vs 157 g/d), **more saturated fat.**
- ▶ However, data from the British Heart foundation, in 1999, rates of death from coronary heart disease among males aged 35–74 years:
 $115_{/100,000}$ in the US – vs – $83_{/100,000}$ in France.
- ▶ Suggested 1st factor: **France's high red wine consumption.**

French Paradox dimensions

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► Alcohol in wine:

- ✓ R&D: moderate drinkers < heart attacks < heavy drinkers or abstainers
- ✓ Δ Consumption French vs others not enough to explain.

► Need to study further:

- ✓ Typology of alcohol (beer, red wine, white wine, rosé wine, liquors) and diseases impact
 - Different types of cancers – different types of reactions (+ and -)
- ✓ Combination of alcohol
 - with other wine compounds and the origin of compounds
 - and types of food (e.g. saturated fat).
- ✓ Population (e.g. Phenotypes ABO, Aging population,...)

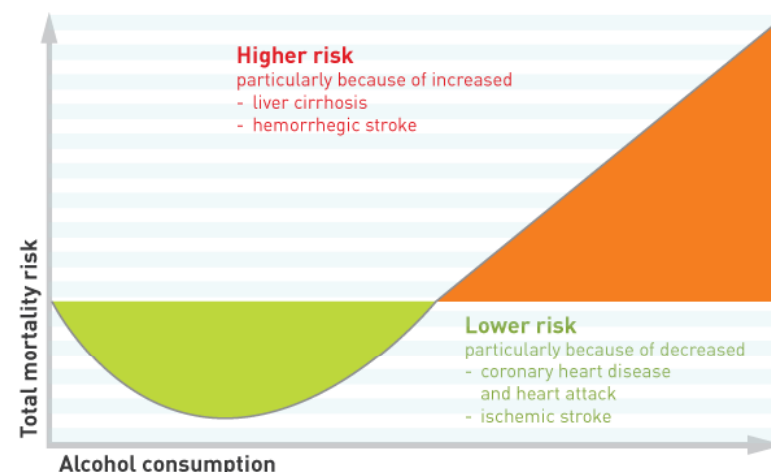
Wine consumption & cancer

- ▶ Regular moderate wine consumption has been associated with several health benefits.

✓ However the risk increases drastically with each drink above moderation. Drinking more will not provide more benefits!

- ▶ INRA study at CancerAlcool:

- ✓ Over 25 years, 100,000 persons (medical health centre)
- ✓ At moderate dosis ($<0.7\text{g}$ alcohol/kg of the person):
 - no significant increase of mortality risk by cancer
 - For persons preferring wine: significant decrease of mortality risk by higher aero-digestive or lungs cancer.



- ▶ ABO Phenotype:
 - ✓ 16 year follow-up study, 3000+ middle-aged & elderly men
 - ✓ Study: Association between alcohol intake, heart disease and all-cause mortality with the blood type.
 - ✓ Results: Effect of wine intake on heart disease and all-cause mortality in men may depend on the ABO phenotypes,
- ▶ Add further support to the existence of genetic/lifestyle associations.

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► Resveratrol

- ✓ Phytoalexin, antibiotics produced naturally by several plants under attack by pathogens (e.g. bacteria, fungi)
 - ✓ Mice and rats: anti-cancer, anti-inflammatory, blood-sugar-lowering and other beneficial cardiovascular effects.
 - ✓ In the skin of red grapes and a constituent of red wine, (not in sufficient amounts to explain the French paradox)
- **In vitro**: multiple molecular targets → the cells of breast, skin, gastric, colon, esophageal, prostate, and pancreatic cancer, and leukemia.

► **Resveratrol in vivo:**

effectiveness \searrow by its poor systemic bioavailability (<5% of the oral dose as free resveratrol in blood plasma).

► **Adverse effects and unknowns:**

- ✓ May stimulate growth of human breast cancer cells, possibly because of resveratrol's chemical structure, similar to a phytoestrogen.
- ✓ Other studies: resveratrol actually fights breast cancer
- ✓ Oestrogenic: may interfere with oral contraceptives and with teenagers development

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► Polyphenols & Procyanidins & Flavonoids

- ✓ chemical substances found in plants
 - hydrolyzable tannins and phenylpropanoids (lignins, flavonoids)
 - and condensed tannins
- ✓ best studied polyphenols: flavonoids, which include several thousand compounds, incl. : flavonols, flavones, catechins, flavanones, anthocyanidins, and isoflavonoids.
- ✓ Sources: berries, tea, beer, grapes/wine, olive oil, chocolate/cocoa, coffee, walnuts, peanuts, borojo, pomegranates, yerba mate, ...
- antioxidant characteristics+potential health benefits:
 - ✓ help the body's cells resist damage by free radicals.

- ▶ Class of flavanols: Proanthocyanidin, also named: Procyanidin oligomeric proanthocyanidin (OPC), pycnogenol, leukocyanidin, leucoanthocyanin and condensed tannins.
- ▶ Mainly polymer chains of flavonoids such as catechins. Discovered in 1936 by Pr J. Masquelier. Was called Vitamin P.
- ▶ Pr R. Corder: oligomeric procyanidins. assumption: greatest degree of protection to human blood-vessel cells.
 - ✓ 165 wines tests → greatest concentration in European red wines from certain areas correlates with longevity.
 - ✓ Highest procyanidins in wines from the Tannat grape, grown in the Gers area of southwest France.

- ▶ Other R&D: wine polyphenols \searrow absorption of malondialdehyde, which is implicated in arteriosclerosis, cancer, diabetes and other diseases.
- ▶ Most abundant flavonoid polyphenols in red wine – up to 1g/l
 - ✓ clinical trials: 200-300 mg/d \rightarrow lower blood pressure.
2 glasses (2x125 ml) Madiran wine (southwest France).
 - ✓ **However several times this amount by eating an apple.**
 \rightarrow need to explain specific impact of (red) wine.
+ to be linked with other diets and compounds.

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- ▶ **Tannat:** red wine grape, historically Madiran AOC;
 - ✓ now prominent grapes in Uruguay; also grown in Argentina, Australia, Brazil and in Italy (Puglia) as a blending grape.
 - ✓ US plantings in California have increased dramatically in the first years of the 21st Century.
 - ✓ Tannat wines in Uruguay are quite different (lighter in body and lower in tannins) from Madiran wines.
 - ✓ In France, to solve the harsh tannic nature of the grape
→ winemaking technique known as micro-oxygenation.

- ▶ Several hundred of polyphenolics compounds in wine → taste, color and mouthfeel of wine.
- ▶ 2 broad categories:
 - ✓ Flavonoïds:
 - anthocyanins (colour)
 - tannins (mouthfeel)
 - ✓ Non-flavonoïds:
 - stilbenes (e.g. resveratrol)
 - compounds derived from acids in wine (e.g. benzoic, caffeic and cinnamic acids).

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- ▶ **Winemaking:** maceration process or "skin contact" is used to increase the influence of phenols in wine.
 - ✓ Phenolic acids: in the pulp or juice of the wine; also found in white wines (not usually through maceration).
 - ✓ Oak aging: can induce phenolic compounds, most notably in the form of vanillin which adds vanilla aroma to wines.
- ▶ Rhône valley winemaking process on some wines:
 - "Flash détente" = 100% increase of tannins.

Conclusion, a need for...

- ▶ Thorough definition of the quality: typology / alcoholic content; + quantity of alcoholic drinks.
- ▶ Support of synergetic effects of other functional food components, e.g.: antioxidants, saturated fats and other lipids and synergetic effects of lifestyles.
- ▶ Exact definition of the human group in the studies.
- ▶ Studies: influence of PDO specification + traditional approaches linked to *terroir* → on functional food components, their quality & derived health products
- ▶ Info and training of wine producers and consumers
→ www.oeno-mac.eu Leonardo da Vinci project.

- ▶ www.oeno-mac.eu
- ▶ Scientific abstract – Wine Information Council:
www.wineinformationcouncil.eu/index.php?option=com_wicabstract&Itemid=2
- ▶ French Paradox: en.wikipedia.org/wiki/French_paradox
- ▶ Resveratrol: en.wikipedia.org/wiki/Resveratrol
- ▶ Polyphenols: en.wikipedia.org/wiki/Polyphenols
- ▶ Tannat: en.wikipedia.org/wiki/Tannat
- ▶ en.wikipedia.org/wiki/Phenolic_compounds_in_wine
- ▶ www.wineinmoderation.eu
- ▶ www.elusduvin.org

Thank you for your attention!

- ▶ Wine & alcoholic beverages are only appreciated in moderation.
- ▶ This presentation doesn't claim any demonstrated therapeutic action of wines nor its contrary. It aims at encouraging studies and keeping open mind.
- ▶ For more information:
www.oeno-mac.eu
- ▶ Yves Boisselier
 MAC-Team aisbl, Belgium
yb@mac-team.eu
- ▶ Konstantinos Sflomos
 TEI of Athens, Greece
ksflomos@teiath.gr
- ▶ Renée Payan
 Université du Vin, Suze La Rousse, France.
universite.du.vin@wanadoo.fr



Education and Culture DG

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