This publication
is an initiative
of SEMELI S.A.

www.artstudio.gr

WINE & HEALTH

George Notas and Elias Castanas
University of Crete School of Medicine

WINE & HEALTH

George Notas and Elias Castanas
University of Crete School of Medicine

Wine in antiquity

Perhaps the world's oldest clay winepress in Archanes, Crete, Greece.

The beneficial effects of wine have been known since antiquity. They were recognized by the doctors of the era; Hippocrates and Galinos used wine for therapeutic purposes, as an antiseptic for wounds and skin before surgical operations, for sterilizing drinking water, as a sedative, sleeping aid, anesthetic, appetite stimulant, cure for anemia and medication against diarrhea, as well as a diuretic, laxative, etc.
Wine may be the oldest medicinal drug, known for some 5000 years.

Wine and man have been connected for centuries. In many civilizations and religions moderate wine consumption played an important part in physical and psychological wellbeing, as well as in longevity.

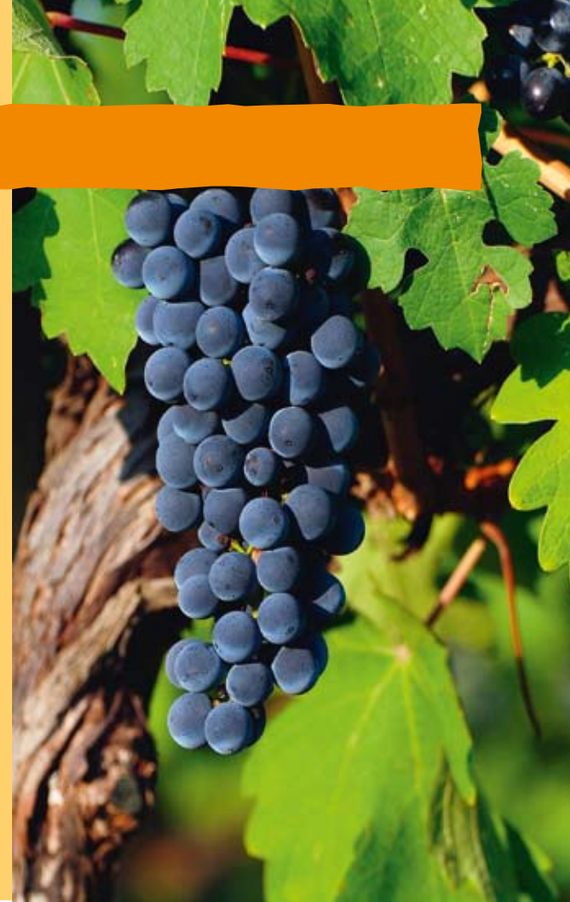
The pharmaceutical use of wine during antiquity might have been based on popular beliefs and unsystematic observations, but many years later advanced laboratory, epidemiologic and clinical studies unveiled a series of effects of wine on human health, confirming older popular uses and revealing new ones.

The Derveni crater, 4th century BC.

Scientific studies

Studies that included over a million people reported that moderate wine consumption with meals on a daily basis can have significant health benefits. This type of consumption lowers the risk of cardiovascular incidents by 20-60%, improves digestion, enhances blood circulation, acts as an anti-inflammatory and disinfectant, strengthens resistance to the common cold and helps with sleep initiation.
Wine also acts as a mild euphoric, enhances the quality of life and promotes longevity, decreasing all-cause mortality by 10-20%. These latest facts confirm many of the uses reported by older studies and ancient texts.

In contemporary medical practice the first indication that wine can indeed benefit human health resulted from observations in France, where, despite a cholesterol-laden diet, a lower heart disease rate compared to other Europeans with similar dietary habits was observed. This has come to be known as the “French Paradox”.



An obvious difference between the French and other diets is the higher consumption of (red) wine.
These initial observations on the beneficial role of wine on (cardiovascular) health were followed by numerous other studies in other ethnic groups with similar results.

In general, these studies have confirmed that moderate wine drinkers have lower death rates from cardio-vascular diseases than abstainers or heavy drinkers. Hence, there is no doubt about the health benefits of moderate wine consumption. This has led to an increased interest for studies regarding the mechanisms involved in the beneficial effects of wine on human health. There are still, however, a lot of unanswered questions, some of which, also shared by the well-informed consumers of today, are discussed in the following chapters.

How does wine affect health?

Wine affects a series of major mechanisms involved in the development and progression of chronic human illnesses. Two of the most important among them are the protection it offers against free radicals and its ability to prevent atherosclerosis and the diseases related to it, such as myocardial infractions, strokes and peripheral arterial disease.
In 1956, Denham Harman developed the free radical theory of aging. Free radicals, produced by metabolism and other biological reactions, cause cumulative damage to the cells and lead to ageing and eventually death.

During the last 50 years, Harman's theory has been confirmed by many scientific studies. Free radicals are unstable molecules that react with cell membranes and other intracellular structures, causing tissue damage. During these events, through a chain reaction process, they lead to the production of more and more harmful molecules that perpetuate molecular and tissue damage. Damage to biomolecules like DNA, proteins and lipids renders them unable to perform their normal functions.

The detrimental effects of free radicals can lead to diseases like cancer and atherosclerosis, ageing and even death. Under normal circumstances, the human body possesses adequate systems for neutralizing them. However, ageing, stress and external factors, such as environmental or dietary challenges, may render these systems inadequate. Therefore, scientists are currently searching for compounds that can counter the damaging effect of free radicals. Anti-oxidants and trapping agents are such compounds and wine is very rich in them.

Wine is indeed a very rich source of anti-oxidants, with polyphenols being the most important. One glass of red wine is equivalent to 7 glasses of orange juice, 2 glasses of tea, 5 apples or 100 grams of onions.

Polyphenols are found mainly in the skin and the seeds of grapes and are, therefore, present in much lower concentrations in white wine.

1 glass of wine is equivalent to:

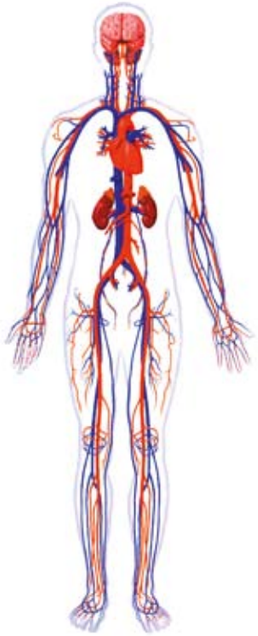
7 glasses of orange juice

2 cups of tea

5 apples

100g of onions

Atherosclerosis (arteriosclerosis)



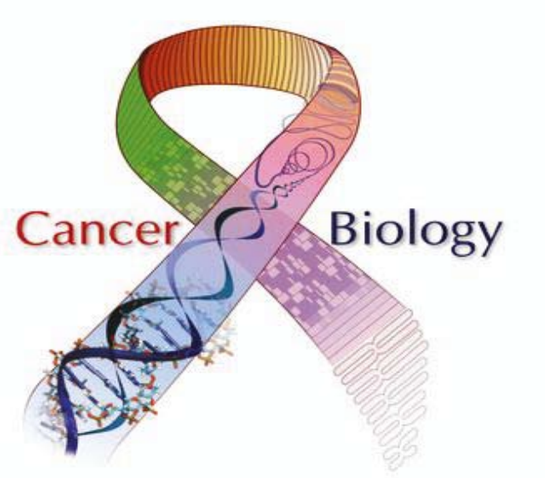
As our main example we will refer to the effect of wine in atherosclerosis, a specific form of arteriosclerosis. The mechanism that causes it involves a combination of damage to the arterial wall, while oxidized LDL cholesterol builds up within the layers of the wall and creates atheromatous plaques. The accumulation of these plaques narrows the arteries and can lead to complete blockage.

In cases where the plaques are ruptured and dislodged they cause local vascular constriction and clot formation, and can lead to complete obstruction of blood flow, causing tissue ischaemia or necrosis in the organ perfused by this artery. Free radical formation is exacerbated both under chronic and acute ischaemia, leading to a vicious circle of progressive health complications. Wine can affect all these mechanisms in many ways.

The absorption of polyphenols after consuming wine traps free radicals and therefore blocks the oxidation of useful molecules and LDL cholesterol. Even if LDL is oxidized, polyphenols protect artery cells. They also inhibit natural vascular constriction agents and attract vasodilators, preventing artery narrowing when damaged.

At the same time, wine increases HDL cholesterol levels. HDL is capable of preventing the formation of atheromatous plaques in the arteries, by transporting cholesterol to the liver, and thus is a protective mechanism against coronary artery disease. It also contains salicylic compounds that work like aspirin, blocking platelet aggregation, a main cause of clot formation and arterial thrombosis.

Wine and cancer



The effect of wine on cancer is not yet fully understood. According to a series of epidemiological studies, some types of cancer (breast, lung, prostates and colon) are less frequent in populations that consume moderate amounts of wine. Moreover, a number of laboratory studies have shown that polyphenols in wine have excellent cancer preventing properties.
The molecular mechanisms through which wine and its compounds affect cancer are extremely complicated. We are now discovering that on top of their anti-oxidant properties, wine polyphenols can have a more direct effect on the molecular mechanisms of cancer cells and are able to inhibit their proliferation. Studies have shown that some polyphenols may alter the activity of a number of genes associated with cell proliferation and the invasiveness of cancer. According to the experts, however, more studies are needed. Many of them should focus on answering if the addition of moderate amounts of wine to the diets of populations that are currently not consuming wine can reduce the onset of some types of cancer. Finally, ongoing studies are close to establishing that some wine polyphenols may have medicinal properties that can affect certain hormone-sensitive tumors.

Is alcohol consumption beneficial in general or are the positive effects limited to wine?

The protective effect of alcohol on the arteries was studied a few years ago. Moderate alcohol consumption has indeed some temporary vasodilatory effects. However, comparative studies on wine and other alcoholic beverages have shown that beer and spirits containing high levels of alcohol, like whiskey or vodka, have minor or insignificant beneficial effects on coronary artery disease, compared to wine. Specifically, it was shown that moderate wine consumption for 12 to 18 years may increase life expectancy. This was not the case with other alcoholic beverages.

Therefore, wine's major preventive effects against coronary disease seem to be unique. This is due to the fact that wine, as a natural extract of grapes, contains large quantities of the above mentioned micro-nutrients that are not included, produced or co-distilled during the production of other alcoholic beverages.

Does wine affect weight gain?

Wine contains alcohol. Two grams of alcohol are equivalent to one gram of sugar.
Wine also contains small quantities of sugars and therefore has 30 calories per glass –a minor intake when consumption is moderate (2-3 glasses per day).
Wine can also help against the Metabolic Syndrome, a condition characterized by the combination of obesity, elevated blood sugar and hyperlipidemia.

According to recent studies, this has been attributed to wine's micro-nutrients (mostly polyphenols) that activate human metabolism and calorie consumption while at the same time they inhibit the accumulation of body fat.

How much wine is beneficial on a daily basis?

Scientific data suggest that 2 to 3 glasses of wine per day for men and about half of that for women is enough to provide the health benefits of wine. Quantity is very important because alcohol abuse has negative health effects. As far as quantity is concerned, the turning point between beneficial and adverse health effects may differ from person to person, depending on genetic predisposition and body type, hence the difference in suggested quantities for men and women.

In what other diseases is wine beneficial?

The finding of the negative correlation between wine consumption and coronary artery disease mortality as well as all-cause mortality has led to further epidemiological studies that have associated wine drinking with lower incidence rates of other diseases, such as strokes, all types of dementia including Alzheimer's, macular degeneration (most common cause of blindness in the Western world), kidney and gallstone formation, benign prostatic hyperplasia and diabetes.

Unfortunately, most of these are small scale studies that often have methodology problems and are treated with skepticism by the scientific community.
Therefore, the findings of these studies must be interpreted with caution and must be confirmed with larger and methodologically robust studies, before clear recommendations can be made.

However, the protective properties of wine against some of the main degenerating and chronic diseases in the Western world is an undisputable fact.

Recent studies have shown that some of wine's polyphenols are strong activators of endogenous anti-aging compounds.
These compounds (mainly represented by an enzyme called sirtuin 1) mimic the benefits of limiting calorie intake, slow aging and increase the life span of some organisms.

Polyphenols can also retard the development of some diseases or conditions related to the aging of mammals. Even though these results were initially greeted with great enthusiasm, they still have to be confirmed in humans.

Is white wine as beneficial as red?

As mentioned previously, the beneficial effects of wine mostly derive from the significant quantity of micro-nutrients found in the skin and seeds of grapes.
These compounds react with alcohol and are gradually extracted during fermentation and transferred from the skin and seeds to wine.

White wine is usually produced by separating the skin and seeds from the wine-must to block coloring agents (and many polyphenols) from the final product.
As a result, the polyphenol content of white wine is considerably lower. Nonetheless, some other compounds (salicylates, phenolic acids and a small amount of polyphenols) are also present in white wine.

Is grape juice as beneficial as wine?

No! As mentioned before, polyphenols are extracted during fermentation.
Grape juice is much poorer in polyphenols. The small quantities of salicylates (aspirin-like compounds) and phenolic acids it contains have totally different properties.

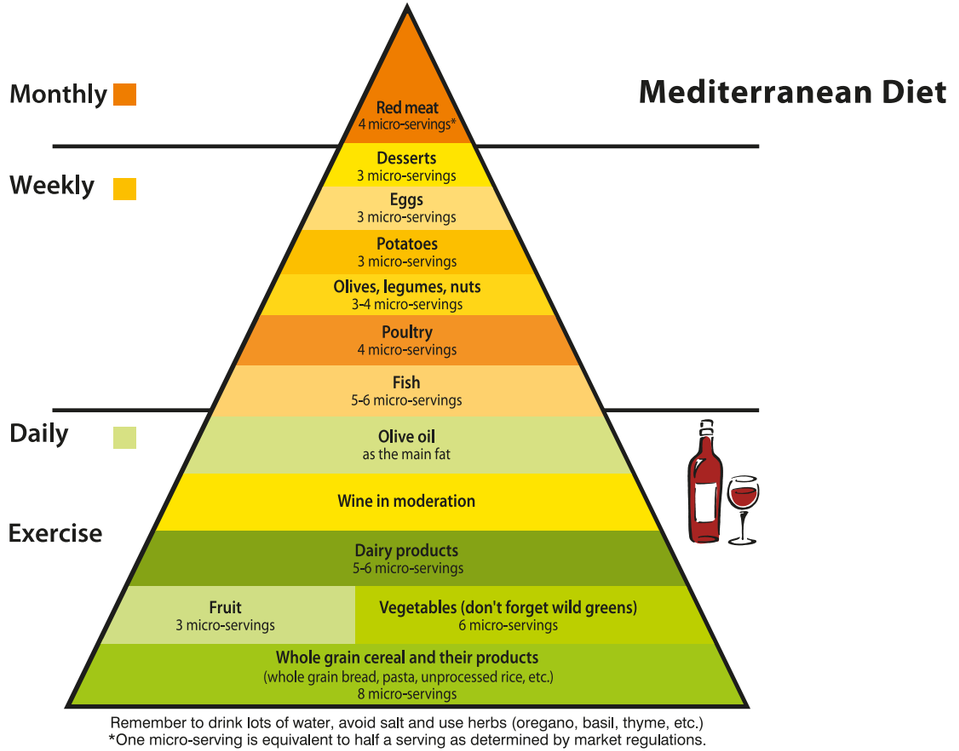
Therefore, the aforementioned health benefits are characteristics unique to (mainly red) wine.

Conclusion

In conclusion we can say that beyond the pleasure of taste, wine is also a convenient, everyday weapon for the protection of our health. In order to gain the most from wine we must always consider it as part of the Mediterranean diet, which includes plenty of fruits and vegetables, olive oil, fish and only small amounts of red meat.

Wine's high polyphenol content offers an excellent shield against some of the most common diseases of our time that are characteristic of the Western way of life, such as coronary artery disease and cancer. It is clear however, that more studies are needed in order to understand the mechanisms regulating the effects of wine on coronary artery disease and other human diseases, and allow us to benefit from it in the best possible way.

As mentioned above, some of the health benefits of wine have already been established while new ones are identified as research in this field is expanding. Although it is clear that wine might have important medicinal properties, it is not a "medication" and we don't believe it should be sold in pharmacies.



Remember to drink lots of water, avoid salt and use herbs (oregano, basil, thyme, etc.)
*One micro-serving is equivalent to half a serving as determined by market regulations.

Wine as a key item of enjoyment and culture

Wine was and will always be a key item of enjoyment and culture. It is a staple of the Mediterranean way of life, culture and civilization.

Oeno and her sisters, Spermo and Elais, helped conquer Troy. Semeli gave Zeus the happy god, Dionysus, benefactor and destroyer. The god who, like Jesus, was born, raised, then died and was resurrected. He gave us the sweet juice of the grape, the same way He gave us his blood, a few thousand years later.

For the people the juice was a gift from God, the blood of the God, and was used in medicine, magic and religion, and accompanied them in every aspect of their lives.

As mentioned above, it seems that the ancient (mystical and medicinal) uses of wine are being confirmed today. May the blood of the gods, blessed by sweet Semeli, continue to accompany the beautiful moments in our lives.

Wine and man have been connected for centuries.

In many civilizations and religions wine played an important part as a unique drink, related to moderation, physical and psychological wellbeing, as well as a balanced way of life and longevity.

The pharmaceutical use of wine during antiquity might have been based on popular beliefs and unsystematic observations, but many years later epidemiology and advanced laboratory and clinical studies have allowed us to unveil a series of mysteries about the effects of wine on human health, confirming older popular uses and revealing new ones.