It came to be a turning point for the wine sector, worldwide. In 1992, two French scientists - Serge Renaud and Michel de Lorgeril - made history with an observation that appeared illogical.

Even though the French consumed high amounts of saturated fats, smoked cigarettes and had high blood pressure, they had one of the lowest rates of cardiovascular disease in the western world. The findings were broadcast on 60 Minutes in the US and then in Australia. The ‘French Paradox’ was born.

The wine world was quick to capitalise on the research. The scientists said that the paradox came down to drinking moderate amounts of wine - red wine to be precise. They had also found that drinking moderate amounts with meals, in particular, could reduce the risk of cardiovascular disease (such as heart attacks and strokes resulting from blocked arteries, as well as high blood pressure, which is also a risk factor for cardiovascular disease) by up to 40%, compared with people who did not drink at all.

Since 1992, there has been dedicated research throughout the world to find out more about wine and its connection to health. Sometimes the findings have been complex, at other times, confusing. The Australian Wine Research Institute (AWRI) has been at the forefront throughout, using the best science available to pick its way through the evidence and counter evidence to give the wine sector, policy-makers and consumers the answers they are looking for. Is wine different from other alcoholic drinks? Does it affect human health in a different way? And if so, how and why?

WHY MODERATION IS KEY

There is no doubt that the excessive or heavy consumption of wine, whether regularly or once a week on a Friday or Saturday night, is not good for human health.

Heavy drinking on a regular basis or ‘binge’ drinking increases the risk of cardiovascular disease. It is also known to make drinkers more likely to have accidents or suffer from other alcohol-related diseases, such liver as cirrhosis, pancreatitis and certain cancers.

In men aged over 40 and women over 50, however, regular, moderate wine drinking has been shown to have health benefits - at a time of life when the risk of cardiovascular disease increases. Scientists and the medical profession have defined regular, moderate drinking as one to two standard drinks of wine per day; a standard drink is 10g alcohol. The combination of food and wine entering the digestive system delays and lowers the amount of ethanol entering the blood stream and the resultant blood alcohol concentration associated with cellular and tissue damage. It also minimises short-term risks to health, such as accidents, and maximises or prolongs any acute and short-term health benefits. What are the health benefits, however, and how do they work?

UNDERSTANDING THE PARADOX

Since 1992, scientists have tried to find out why French wine drinking habits appear to have a beneficial effect on health.

The French Paradox was a ‘hit’ on US television for a reason: back in 1992, the rate of cardiovascular disease in the US was double the rate in France9. What’s more, wine drinkers in the US seemed to have similar, lower rates of heart disease. Beer and spirit drinkers did not.

As scientists continued to investigate why the paradox existed and who it applied to, they developed the J-shaped curve (Figure 1)º. It showed the relationship between the amount of wine consumed and the risk of disease and death. In particular, it showed that the risk of disease and death decreased when wine was consumed in moderation. For example, it showed that wine appeared to be particularly effective in reducing the risk of cardiovascular disease, which is the leading cause of death in the developed world, accounting for 25-50% of all deaths. The reduced risk of disease and death with moderate wine consumption has since been extended to include a reduced risk of accidents and certain cancers which is called ‘all cause mortality’.
But how did wine work? In 1992, the biology behind the J-shaped relationship had only been suggested and not tested. Cholesterol was thought to hold the key, but scientists did not know how the chemical compounds in wine might change or affect cholesterol behaviour in the human body. Cholesterol is produced by the liver but is also absorbed into the body from dietary animal fats.

Today, it is well known among consumers as well as medical professionals that there are two principal types of cholesterol: ‘good’ and ‘bad’. ‘Good’ cholesterol, or high-density lipoprotein (HDL), removes the ‘bad’ cholesterol from the bloodstream. The ‘bad’ type, or low-density lipoprotein (LDL), when oxidised can be deposited on blood vessel walls where it accumulates to block blood flow. To understand how wine affects HDL and LDL, the AWRI teamed up with the CSIRO Division of Human Nutrition. In a test tube, research showed that phenolic compounds - natural chemical compounds found in wine, fruit and vegetables in significant amounts - prevented LDL from depositing on the walls of blood vessels.

The wine-derived phenolic compounds worked by preventing the LDL from oxidising, which is a chemical process that ‘prepares’ or ‘primes’ the LDL to attach to the blood vessel wall. The research showed that the amount of phenolic compounds circulating and working in the bloodstream may be 10 to 100 times more than required in a test tube to have an effect. When the anti-oxidant effect was assessed in animals and humans, however, the amount or dose needed is higher than first thought. Although they are easily absorbed by the human body, scientists have observed that they are also readily broken-down or metabolised in the liver and small intestine.

The way Forward

So where to from here? A recent analysis of 54 published population studies on alcohol use and risk of death has seriously challenged the idea that moderate wine consumption is generally beneficial to human health. This analysis has had an influence on new alcohol and public health strategies proposed in Australia and overseas. It has been used to justify higher taxes on alcoholic beverages and restrict how they are advertised. Few recent research papers have responded to this challenge. Therefore, the results of any new studies undertaken by the AWRI in the area of consumer health and safety will provide important data for the Australian wine sector.
The sector will be able to demonstrate its duty of care to its consumers, using science to show how much wine consumption offers health benefits while minimising any adverse effects. The results could play a key role in the design and support of future business and marketing strategies, and will inform future grape and wine production research.

Furthermore, Australia is a country where cardiovascular disease is currently the leading cause of death. Around 35% of Australians die from it and the Heart Foundation says their deaths are largely preventable. The rate of cardiovascular disease is two to three times higher in Australia than in Mediterranean countries.

Australia’s elderly population is also growing. It is the same story in other developed countries. Identifying safe, effective and cost-efficient ways to help people stay healthier for longer could provide enormous health and economic benefits. It makes sense for healthcare professionals and policymakers to give phenolic-rich wine serious consideration alongside a low fat diet supported by an exercise regime.

SUMMARY
- moderate wine drinking has been shown to have health benefits for men and women in later life, who are at greater risk of heart trouble and cardiovascular disease
- the ‘French Paradox’ was a turning point in showing how moderate wine drinking, with meals, could help people live longer
- since 1992, scientists have tried to understand how the paradox works by investigating phenolic compounds and their effect on human health
- results so far have shown that phenolics do help to protect the heart and blood vessels from damage. The AWRI is part of collaborations taking the research further to look at how phenolics work when they are metabolised, or used in the body
- the AWRI is also monitoring new investigations and discoveries connecting moderate wine drinking to cancer prevention and better cognitive function.

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