USANA Technical Bulletin

Grape Seed Extract

Technical Background

- Coronary heart disease (CHD) and atherosclerosis have been linked to the consumption of saturated fat and cholesterol.[1] However, World Health Organization data has shown that in certain regions of France where the population consumes high levels of saturated fat and where serum cholesterol levels and other risk factors are similarly high, deaths from CHD are significantly lower than in the US.[2,3] This so-called *French Paradox* has spurred much scientific investigation. The only dietary factor that showed a significant inverse correlation with CHD was consumption of red wine.
- The cardio-protective effect of red wine has been attributed to a group of bioflavonoid compounds[4] called proanthocyanidins. Other names for these phytochemicals include flavonols, catechins, tannins, and oligomeric procyanidins (OPC), to name only a few.
- Proanthocyanidins are concentrated in the seeds of the grape. These compounds are incorporated into red wine during the fermentation process when the must (crushed grapes, seeds, stems, skin and juice) are held in vats for several weeks.
- *In vitro* (laboratory) studies on catechin, epicatechin, and grape bioflavonoids have shown them to be free radical scavengers that may be several times more potent than the antioxidant vitamins C and E.[5,6] These compounds effectively inhibit oxidation of human low-density lipoproteins (LDL).[7,8]
- Human studies with red and white wine have confirmed that some phenolic compounds in red wine are absorbed into the blood and become associated with LDL. These phenolic compounds then reduce the susceptibility of the LDL to peroxidation.[9]
- Additional *in vivo* studies with rats fed catechin, grape seed phenolic monomers, or grape seed polymers showed that the longer chain polymers are not absorbed in the intestine, though the monomers (and some of the oligomers) are absorbed.[10] This suggests that these smaller compounds are responsible for the inhibition of LDL peroxidation in blood plasma. However, the longer chain and polymeric compounds may reduce plasma total cholesterol, triglycerides, LDL and VLDL cholesterol levels, and increase HDL levels.[11] These effects may occur through an inhibition of intestinal cholesterol absorption.
- Grape seed proanthocyanidins provide protective antioxidant effects, significant cardiovascular health benefits, and beneficial effects on the circulatory system.[12, 13, 14, 15, 16]

Sources and Recommended Intake

- No Recommended Dietary Allowance (RDA) has been established for grape seed or other bioflavonoids.

- The principal food source for grape seed bioflavonoids is red wine. White wine and grape juice also contain smaller amounts of proanthocyanidins.
- While many scientists would recommend 1 or 2 glasses of red wine per day, no official agency has adopted this recommendation for fear of the obvious detrimental health effects of over-consumption of alcohol.

Abstracts

Frankel EN; Kanner J; German JB; Parks E; Kinsella JE. Inhibition of oxidation of human low-density lipoprotein by phenolic substances in red wine. Lancet 1993 Feb 20;341(8843):454-7. The "French paradox" (apparent compatibility of a high fat diet with a low incidence of coronary atherosclerosis) has been attributed to the regular drinking of red wine. However, the alcohol content of wine may not be the sole explanation for this protection. Red wine also contains phenolic compounds, and the antioxidant properties of these may have an important role. In in-vitro studies with phenolic substances in red wine and normal human low-density lipoprotein (LDL) we found that red wine inhibits the copper-catalysed oxidation of LDL. Wine diluted 1000-fold containing 10 mumol/L total phenolics inhibited LDL oxidation significantly more than alpha-tocopherol. Our findings show that the non-alcoholic components of red wine have potent antioxidant properties toward oxidation of human LDL

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