

USANA Technical Bulletin

Disclaimer: The information provided in this Technical Bulletin is strictly educational. It may not be used to promote USANA products, nor is it intended as medical advice. For diagnosis and treatment of medical disorders, consult your health care professional. When there are references to third party websites, addresses, and/or phone numbers, USANA, Inc. makes no claim, actual or implied, regarding the content or validity of the information obtained from such sources. This Technical Bulletin may be copied and freely distributed only if all text remains intact and unchanged.

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 compounds⁴ 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 μmol/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

References

- ¹ NRC. Diet & Health. National Research Council. National Academy Press 1989. Washington, DC.
- ² Kinsella JE, Kanner J, Frankel EN, German B. Wine and Health: The possible role of phenolics, flavonoids and other antioxidants. 107-121 in "Proceedings" Potential Health Effects of Components of Plant Foods and Beverages in the Diet. University of California Davis, August 15-15, 1992.
- ³ Renaud, S., De Lorgeril, M. Wine, alcohol, platelets and the French Paradox for coronary heart disease, Lancet 1992;339: 1523-1526.
- ⁴ Frankel, EN, Kanner J, German B, Parks E, Kinsella JE. Lancet 1993;341: 454-457.
- ⁵ Ricardo da Silva JM, Darmon N, Fernandez Y, Mitjavila S. Oxygen Free Radical Scavenger Capacity in Aqueous Modles of Different Procyanidins from Grape Seeds. J Agric Food Chem 1991;39: 1549-1552.
- ⁶ Kanner J, Frankel EN, Grait R, German J, Kinsella JE. Natural Antioxidants in Grape and Wine. J Agric Food Chem 1994;42: 64-69.
- ⁷ Frankel EN, Waterhouse AL, Teissedre PL. Principle Phenolic Phytochemicals in Selected California Wines and their Antioxidant Activity in Inhibiting Oxidation of Human Low-Density Lipoproteins. J Agric Food Chem 1995; 43: 890-894.
- ⁸ Meyer AS, Yi O, Pearson DA, Waterhouse AL, Frankel E. Inhibition of Human Low-Density Lipoprotein Oxidation in Relation to Composition of Phenolic Antioxidants in Grapes. J Agric Food Chem 1997;45: 1638-1643.
- ⁹ Fuhrman B, Lavy A, Aviram M. Consumption of red wine with meals reduces the Susceptability of Human Plasma and Low Density Lipoprotein to Lipid Peroxidation. Am J Clin Nutrition 1995;61: 549-554.
- ¹⁰ Bravo L, Abia R, Eastwood MA, Saura-Calixto F. Degradation of Polyphenols (catechin and Tannic Acid) in the rat Intestinal Tract. Effects on Colonic Fermentation and Feecal Output. British J. Nutrition 1994;71: 933-946.
- ¹¹ Tebib K, Besancon P, Rouanet JM. Dietary Grape Seed Tannis Affect Lipoproteins, Lipoprotein Lipases and Tissue Lipids in Rts Fed Hypercholesterolemic Diets, J. Nutrition 1994;124: 2798-2799.
- ¹² Tixier JM, Godeau G, Robert AM, Hornebeck W. Evidence by in vivo and in vitro studies that binding of pycnogenols to elastin affects its rate of degradation by elastases. Biochem Pharmacol 1984;33: 3933-3939.
- ¹³ Cissele MB, Galloway MT, Karim M, Kappogoda T. Red wine induced endothelium dependent relaxation. 1997. Abstract from the 69th session of the American Heart Association.
- ¹⁴ Bagchi D et, al. Free radicals and grape seed proanthocyanidin extract: importance in human health and disease prevention. Toxicology. 2000 Aug 7;148(2-3):187-97.
- ¹⁵ Cos P, De Bruyne T, Hermans N, Apers S, Berghe DV, Vlietinck AJ. Proanthocyanidins in health care: current and new trends. Curr Med Chem. 2004 May;11(10):1345-59.
- ¹⁶ Ariga T. The antioxidative function, preventive action on disease and utilization of proanthocyanidins. Biofactors. 2004;21(1-4):197-201.