

**BERRYVIN™**  
HIGH ORAC BERRIES



## TECHNICAL BULLETIN ITEM 1615



## **SUMMARY**

Science has long touted the benefits of eating a diet rich in fruits and vegetables. Phytochemicals such as flavonoids in fruits and vegetables are believed to be antioxidants and possess chemoprotective properties and may also help lower risk for cardiovascular disease. BerryVin™ is a proprietary high oxygen radical absorbance capacity (ORAC) formula containing strawberries, blueberries, blackberries, cranberries, escobillo berries, grape extract and pomegranate extract. BerryVin is manufactured in the USA and each lot is tested and guaranteed an ORAC value of between 3500 - 5000 TE/g.\*

- Scavenging free radicals and protecting proteins and LDL cholesterol against oxidative damage\*
- Supporting plasma antioxidant capacity and improving blood circulation\*
- Promotes cardiovascular health\*
- Enhancing the body DNA repair system against cell damage and a healthy inflammatory response in the body\*

## **RECOMMENDED DOSAGE**

300 mg per day.

## **WARNING**

Pregnant women and individuals who are taking prescription drugs or who will be undergoing surgery should consult a physician prior to taking BerryVin™ and other dietary supplements.

## **BACKGROUND**

Diet is considered a key risk factor associated with many diseases.<sup>1</sup> In recent epidemiological studies, evidence indicates that fruit and vegetable consumption is inversely related to incidence of cancer<sup>2</sup> and coronary heart disease.<sup>3</sup> For example, the typical diet common to the Mediterranean region is high in fruits and vegetables and is often associated to lower mortality rates among the elderly population from this area.<sup>4\*</sup>

Current research shows that fruits such as berries, grapes and pomegranates are rich in phenolic compounds like ellagic and gallic acids and catechins<sup>4,5,6</sup>, as well as anthocyanins and flavonoids, which are responsible for the fruits' rich colors.<sup>7</sup> The most well-known property of these phytochemicals is their ability to act as powerful antioxidants and protect the body from free radicals.<sup>8</sup> Free radicals are species containing one or more unpaired electrons in their outer orbits. These electrons are highly reactive and oxidize proteins, lipids and carbohydrates, leading to cell damage and cell death in the form of atherosclerosis, coronary heart disease and cancer.<sup>9</sup> The scavenging capacity of an antioxidant can be evaluated using the ORAC assay, which measures the ability of a substance to disarm oxygen-free radicals compared to a reference sample of Trolox, a derivative of tocopherol. Results are reported as mmoles of Trolox equivalents (TE/g).\*

Consumption of certain berries such as blueberries was associated with increased plasma antioxidant capacity in the postprandial state<sup>14</sup>. Edible berries cultivated or collected in the province of Quebec, Canada, were subject to *in vitro* tests of anti-cancer efficacy, including antioxidant capacity, anti-proliferative activity, anti-inflammatory activity, induction of apoptosis and cell cycle arrest – all mechanisms that may have roles in the onset and spread of tumors. The growth of various cancer cell lines, including those of stomach, prostate, intestine and breast, was strongly inhibited by individual juices of raspberry, blackcurrant, whitecurrant, gooseberry, velvet leaf blueberry, low-bush blueberry, sea buckthorn, and cranberry<sup>15</sup>. Berries also contain a wide variety of low molecular weight phenolic acids which might act as anti-inflammatory agents in the colon<sup>17</sup>.\*

A breakthrough in berry science was reported by Japanese researchers finding that berry anthocyanins, particularly cyaniding 3-glucoside, C3G, a pigment widespread in dark berries, improve blood sugar levels and insulin sensitivity in type 2 diabetic mice<sup>16</sup>.

### **METHOD OF ACTION**

It is not entirely clear how antioxidants with a high ORAC value can reverse inflammatory responses and neuronal deficits related to age and long term oxidative stress. Studies using antioxidant enriched foods from strawberries and blueberries<sup>5,10,11</sup> to apples and spinach<sup>10,11,12</sup> have shown positive results for antioxidant supplementation.\*



One mechanism suggests that antioxidants inhibit expression of cytokines such as interleukin-1 and tumor necrosis factor.<sup>11</sup> In rats fed an antioxidant-rich diet with high ORAC value, malondialdehyde (measured as evidence of oxidative damage) was decreased compared to levels measured in rats fed a low ORAC diet.<sup>11</sup> Another proposed mechanism indicates that antioxidants regulate protective genes such as  $\gamma$ -glutamylcysteine synthetase promoter (GCS), which is the enzyme that controls the rate of glutathione synthesis. Short-term feeding of a blackberry-blueberry juice to mice increased GCS-controlled luciferase activity in the brain and skeletal muscle and glutathione levels in the heart.<sup>13\*</sup>

Research indicates that berry and grape phenols are highly bioavailable and absorbable in intact form through the blood.<sup>1,10</sup> Serum grape skin extract levels measured in human volunteers after 4 weeks of ingestion significantly increased. Serum levels later dropped by 18% after supplementation was discontinued for 2 weeks, suggesting that grape phenols are quickly depleted when not supplemented.<sup>1\*</sup>

#### **COMPLEMENTARY NUTRACEUTICALS**

Fat-soluble antioxidants such as Coenzyme Q10, Lycopene and Vitamin E.

#### **DRUG INTERACTION**

None known.

Pregnant women and individuals taking prescription drugs or those who will be undergoing surgery should consult a physician prior to taking BerryVin™ and other dietary supplements.

#### **TOXICITY**

None

## **REFERENCES**

1. Rao AV, et al. Bioabsorption and in vivo antioxidant properties of BioVin® polyphenols: a human intervention study. *Journal of Medicinal Food* 2000;3:15-22.
2. World Health Organization: Details by cause, sex and mortality in WHO regions: estimates for 1999. In *World Health Report 2000*. Geneva, Switzerland: World Health Organization, 2000, Annex Table 3.
3. Renaud S, et al. Wine, alcohol, platelets and the French paradox for coronary heart disease. *The Lancet* 1992;339:1523-6.
4. Willet CW, et al. Mediterranean diet pyramid: a cultural model for healthy eating. *Am J Clin Nutr* 61:1402S-1406S.
5. Ehlenfeldt MK and Prior RL. Oxygen radical absorbance capacity (ORAC) and phenolic and anthocyanin concentrations in fruit and leaf tissues of highbush blueberry. *J. Agric Food Chem.* 2001;49:2222-2227.
6. Aviram M, et al. Pomegranate juice consumption reduces oxidative stress, atherogenic modifications to LDL, and platelet aggregation: studies in humans and in atherosclerotic apolipoprotein E-deficient mice. *Am J Clin Nutr* 2000;71:1062-76.
7. de Groot H and Rauen U. Tissue injury by reactive oxygen species and the protective effects of flavonoids. *Fundam Clin Pharmacol* 1988;23:249-55.
8. Nijveldt RJ, et al. Flavonoids: a review of probable mechanisms of action and potential applications. *Am J Clin Nutr* 2001;74:418-25.
9. Nuttall SL, et al. Antioxidant therapy for the prevention of cardiovascular disease. *QJ Med* 1999;92:239-244.
10. Joseph JA, et al. Reversals of age-related declines in neuronal signal transduction, cognitive, and motor behavioral deficits with blueberry, spinach, or strawberry dietary supplementation. *The Journal of Neuroscience* 1999;19(18):8114-8121.
11. Cao G, et al. Serum antioxidant capacity increased by consumption of spinach, strawberries, red wine or vitamin C in elderly women. *J Nutr* 1998;128:2383-2390.
12. Gemma C, et al. Diets enriched in foods with high antioxidant activity reverse age-induced decreases in cerebellar  $\beta$ -adrenergic function and increases in proinflammatory cytokines. *Journal of Neuroscience* 2002;22(14):6114-6120.
13. Carlsen H, et al. Berry intake increases the activity of the  $\gamma$ -glutamylcysteine synthetase promoter in transgenic reporter mice. *J. Nutr.* 2003;133:2137-2140.
14. Prior RL, et al. Plasma antioxidant capacity changes following a meal as a measure of the ability of a food to alter *in vivo* antioxidant status. *J Amer. College Nutr.* 2007; 26 (2): 170-81.



15. Boivin D, et al. Inhibition of cancer cell proliferation and suppression of TNF-induced activation of NFkappaB by edible berry juice. *Anticancer Res.* 2007; 27 (2): 937-48.
16. Russell WR, Labat A, et al. Availability of blueberry phenolics for microbial metabolism in the colon and potential anti-inflammatory implications. *Mol Nutr. Food Res.* 2007; 52 (6):726-31.