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TRÉ Superfruit Essence: INFLOX

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INFLOX

INFLOX is an abbreviation of inflammation-oxidation. These are considered the twin devils involved in the development of degenerative disease and premature aging.

INFLOX is a proprietary berry and fruit blend which serves as the base for GNLD's TRÉ superfood beverage. This blend consists of white grape, blueberry, elderberry, cranberry, black currant, red grapes, and bilberry.

Plants contain a dizzying array of compounds of nutritional significance including antioxidant polyphenols numbering over 4,000. These antioxidants are active against a wide variety of free radicals including singlet oxygen, peroxy nitrite and hydrogen peroxide. The benefit of a specific polyphenol is influenced by the specific form of free radical with which it helps the body cope. As polyphenols reduce free radicals they also reduce inflammatory activity in the body.

It is often difficult to assign the benefits of polyphenol antioxidants to a specific compound because there are so many in foods. For example, red wine contains over 60 distinct flavonoid antioxidants. Only when foods contain relatively few flavonoids is it possible to assess the value of a particular flavonoid compound. This is not a matter of great concern from a practical standpoint because flavonoids appear to work

synergistically with one another.

Berries are very rich in anthocyanins. These are naturally occurring compounds that give color to plants. Anthocyanins are the second most important coloring pigment in plants after chlorophyll.

Anthocyanins are members of the flavonoid family. These are all water soluble coloring pigments. Anthocyanins have a variety of health promoting benefits, but have received relatively little attention compared to other flavonoids until relatively recently.

The ORAC (Oxygen Radical Absorbance Capacity) test is the commonly used standard to measure the antioxidant capacity of a supplement or beverage. This form of assessment is not ideal as it does not measure all forms of antioxidant activity nor does it evaluate the ability to absorb the antioxidants in supplements, foods, or beverages. The weakness of the ORAC standard is illustrated by the fact that spinach extract proved more effective than strawberries in mea-

asures of antioxidant protection despite the fact that strawberries at 1540 have a higher ORAC score than spinach at 1260. "The researchers conjecture that it may be due to specific compounds or a specific combination of them in the greens." I suspect that ORAC may be a poor means of assessing the protective value of fat soluble substances like carotenoids.

Despite this, high-ORAC foods have been shown in studies to

- increase the antioxidant power of the blood by 10 to 25 percent,
- prevent loss of long-term memory and learning ability in mice as they age,
- Maintain the ability of brain cells to respond to a chemical stimulus with age
- And protect small blood vessels in rats against oxidative damage.

The ORAC of a one ounce serving of TRÉ is 750 units while the ORAC of a bottle of TRÉ is 24,000 units.

GNLD's aim with regard to TRÉ and other nutritional products is to provide a combination of density of nutrition and diversity of nutrition. Density with regard to TRÉ focuses on raw materials known to have a high antioxidant activity. Diversity refers to multiple sources of antioxidants which provide a diversity of benefits. The rest of this paper will discuss some of the diversity of benefits associated with the raw materials incorporated into the INFLOX blend.



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BLUEBERRY

Research on blueberry flavonoids suggests that they may play an important role in improving brain function. One important study concluded, "The results of this study suggest that consumption of a blueberry-enriched diet (2%) may help to protect against neurodegeneration and cognitive impairment."

Blueberry extracts have also been tested as supplements to reduce oxidative damage as a consequence of exposure to high energy radiation. Older people and astronauts are exposed to particles of high-energy and charge. Rats fed blueberry extract for 8 weeks prior to whole body irradiation to duplicate this condition were protected from changes in neuronal function and behavior. This study suggested that blueberry extracts might find their way onto future space flights as well as protecting older individuals from the ravages of aging.

A separate study demonstrated that blueberry extracts may protect and improve memory function as we age. Accuracy of spatial working memory in aged rats (18 months) increased from 60% to 83% following supplementation with blueberries (2% of the diet).

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ELDERBERRY

The cells that line the blood vessels have been demonstrated to pick up and incorporate elderberry flavonoids into their structure reducing the risk of oxidative damage. One study concluded, "These results show for the first time that vascular EC (endothelial cells) can incorporate anthocyanins into the membrane and cytosol, conferring significant protective effects against oxidative insult. These findings may have important implications on preserving EC function and preventing the initiation of EC changes associated with vascular diseases."

Elderberry has gained a reputation in scientific circles for its immune enhancing properties. A key study examined the effectiveness of elderberry extract among those experiencing the flu. A standardized elderberry extract resulted in a significant improvement of influenza symptoms in 93.3% of cases in 2 days, while the control group saw improvement of 91.7% in 6 days. A complete cure was achieved in 2 to 3 days in nearly 90% of the elderberry treated group and 6 days in the placebo group. Elderberry offers promise for improving the outcome in influenza A and B.

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BILBERRY

Bilberry is known for its ability to improve vision, especially night vision. The flavonoids in bilberry



speed the resynthesis of rhodopsin, a substance important to the rods in the retina where vision takes place. The retinal sensory endings are stimulated as rhodopsin is formed and degraded making vision possible.

Bilberry appears to slow damage to blood vessels in the eye in age-related macular degeneration and diabetic retinopathy as well.

Bilberry extract was compared to 10 other berries in one study and shown to be the most effective at inhibiting the growth of human leukemia cells and human colon carcinoma cells in the test tube. Bilberry also encouraged some cancer cells to commit suicide (apoptosis).

Studies conducted on the bilberry have demonstrated that the content of anthocyanins present increases during the ripening process. Riper fruits generally tend to have higher levels of the more biologically active compounds.

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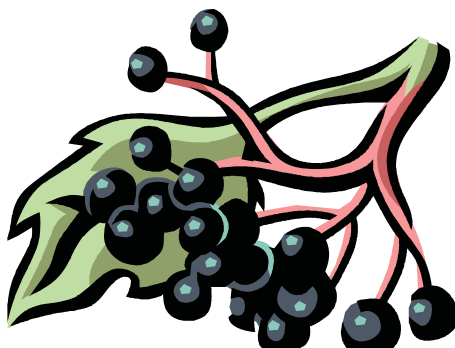
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CRANBERRY

Urinary tract infections are often characterized by pain on passing urine, increased frequency of passing urine, cloudy urine, bloody urine, or increased counts of white blood cells in the urine. Urinary tract infections are 50 times more





common in women than in men.

One in five women is reported to have a lifetime incidence of urinary tract infection. Three percent of these experience recurrent disease. Eleven million women receive medication for urinary tract infections yearly. In one study, cranberry reduced the risk of acquiring urinary tract infections by 20%.

Cranberry inhibits the ability of *E. coli* and other bacteria to adhere to tissues. This prevents the initiation of the process or urinary tract infection. Cranberry polyphenols also inhibit the gathering together of dental plaque bacteria. Compounds called condensed tannins found almost exclusively in cranberry and blueberry are responsible for this activity.

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BLACK CURRANT

The spread of computers has contributed to increased visual problems including eye discomfort, blurring of distant objects, eye strain and visual fatigue. A study by Nakaishi tested the ability of anthocyanosides from black currant to prevent eye fatigue when using video display terminals. The double-blind, placebo-controlled, crossover study with

human subjects demonstrated the ability of black currant to counteract both subjective and objective indicators of visual fatigue after a task.

Major anthocyanins identified in black currant at the present time include delphinidin-3-O-glucoside, delphinidin-3-O-rutinoside, cyanidin-3-O-glucoside, and cyanidin-3-O-rutinoside.

REFERENCE:

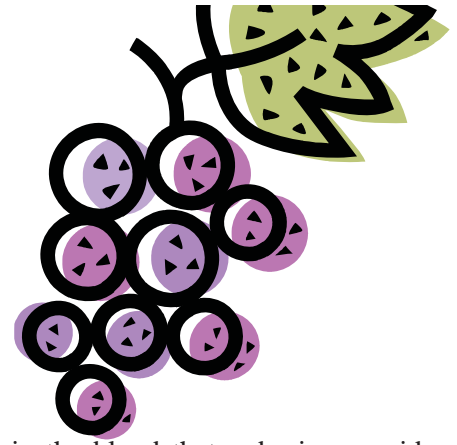
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RED GRAPE

The kidneys remove harmful waste from the body. These wastes can result in oxidative damage and inflammation if they are allowed to accumulate. Hemodialysis is a treatment for kidney failure to try and remove as many wastes as possible. Red grape juice has been demonstrated to improve the outcome of kidney dialysis.

“Twenty-six patients undergoing hemodialysis and 15 healthy subjects were given 100 mL/day of concentrated red grape juice (RGJ), for a period of 14 days. Twelve subjects undergoing hemodialysis who did not receive RGJ served as a control. Results, based on blood tests taken at baseline, twice during the 14 days of intervention, and twice during a 6-month follow up, found that all subjects who consumed RGJ experienced significant improvements in lipoprotein profile, markers of inflammation, and antioxidant status.”

Research also suggests that red grape juice may provide the same kind of antioxidant protection of fats



in the blood that red wine provides. Prevention of oxidation of fats is a key factor in reducing the risk of heart disease. “In evaluating 7 subjects who consumed 125 ml of nonalcoholic red grape juice concentrate for 7 days, there was an elevation of antioxidant capacity on day 8. There was reduced susceptibility of low density lipoprotein to oxidation. Nonalcoholic red grape extract may have similar beneficial effects to red wine.”

A study by Cecil Pace-Asciak and associates concluded that resveratrol can be absorbed from grape juice in biologically active quantities and in amounts that are likely to cause reductions in the risk of atherosclerosis.

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BERRIES

“In a single-blind, randomized, placebo-controlled, intervention trial involving 72 middle-aged, unmedicated subjects with cardiovascular risk factors, consumption of berries was found to exert significant cardio-protective effects.” Good cholesterol rose, blood pressure dropped, and platelet function improved after 8



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weeks.

“The findings are important, because they may partly explain the CVD-protective role of a diet rich in fruit and vegetables. Other types of studies are now warranted to identify the compounds and mechanisms that are responsible for the observed effects.”

REFERENCE:

Erlund I, Koli R, et al, Favorable effects of berry consumption on platelet function, blood pressure, and HDL cholesterol, *Am J Clin Nutr*, 2008; 87(2): 323-31.

ELLAGIC ACID

Ellagic acid is naturally found in pomegranate, grape, blueberry, elderberry, bilberry, and cranberry. This compound is of particular scientific interest because of its powerful activity in inhibition of the carcinogenicity, mutagenicity and cytotoxicity of polycyclic aromatic hydrocarbons. These are substances produced when fuel is burned. They are also found in cooked foods such as grilled meats.

Tests were run with *Salmonella typhimurium* to determine the anti-mutagenic activity of different compounds including ferulic, caffeic, chlorogenic and ellagic acids. The mutagenicity of a given quantity of a

carcinogenic metabolite was inhibited 50% by 150 nmol of ferulic acid, 75 nmol of caffeic acid, 50 nmol of chlorogenic acid, and “most strikingly, 1 nmol of ellagic acid.” A 3 nmol dose of ellagic acid inhibited mutagenicity by 90 percent.

Mammalian studies have shown that ellagic acid is about two orders of magnitude more potent than the other compounds. The researchers state that “ellagic acid is 80-300 times” more effective than other phenols in speeding the disappearance of this potent carcinogen. The study concluded, “These studies demonstrate that ellagic acid is a potent antagonist of the adverse biological effects of the ultimate carcinogenic metabolites of several polycyclic aromatic hydrocarbons and suggest that this naturally occurring plant phenol, normally ingested by humans, may inhibit the carcinogenicity of polycyclic aromatic hydrocarbons.”

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