SOUTHBROOK VINEYARDS

bioflavia™

organic red wine grape skin powder

ORAC Values

ORAC (Oxygen Radical Absorption Capacity) is a standardised test that was adopted by the U.S. Department of Agriculture to measure the Total Antioxidant Potency of foods and nutritional supplements. This standardised test was developed by Dr. Guohua Cao, a physician and chemist at the National Institute on Ageing in Baltimore, Maryland. It provides a very precise way of establishing the Free Radical destroying or neutralising power of a particular food, supplement or compound. The ORAC unit has become one accepted industry standard for measuring antioxidants. The antioxidant test combines a measure of both the **time** an antioxidant took to react and also its antioxidant **capacity** in a given sample. The ORAC unit then combines them into one measure, making it the first in vitro assay method for measuring total antioxidant potential. It is easily expressed as ORAC Units per 100 grams of sample.

The recommended daily antioxidant dose should add up to 5,000 ORAC units each day. In a study of 36 older people, boosting fruit and vegetable intake to reach 3,200 ORAC units a day increased the antioxidant potential of the blood by 10 to 15%; enough to have an impact on disease prevention (Holly, 2003).

Note - Most North Americans are taking in about 1200 **ORAC** units daily. According to government (USDA) estimates, these units come primarily from an average consumption of three servings of fruits and vegetables per day. This means the average person is short between 1800 and 3800 **ORAC** units each day.

Antioxidant measurement units

Three assays methods for the determination of total antioxidant capacity are found in published literature: the oxygen radical absorbance capacity (ORAC) assay, the Randox Troloxequivalent antioxidant capacity (Randox-TEAC) assay, and the ferric reducing ability (FRAP) assay (Cao & Pior, 2002). The FRAP assay is simple and inexpensive but does not measure the SH-group-containing antioxidants. The ORAC assay has high specificity and responds to numerous antioxidants. The ORAC method is chemically more relevant to chain-breaking antioxidants activity, while the FRAP has some drawbacks such as interference, reaction kinetics, and quantitation methods.

*Note – The United States Department of Agriculture, who was previously a publisher of ORAC data, discontinued its web publication of ORAC values for common American foods in 2012. Withdrawn: Oxygen Radical Absorbance Capacity (ORAC) of Selected Foods, Release 2 (2010)". United States Department of Agriculture, Agricultural Research Service. 16 May 2012. http://www.ars.usda.gov/services/docs.htm?docid=15866. Retrieved Feb 4 2013.

The following tables are presented for reference only. Values are not absolute and will be influenced by growing conditions, harvest timing, processing and storage conditions and methods used to measure ORAC Values of the individual foods.

Unless noted as a powder, these values are for unprocessed, fresh products.

Table 1. ORAC (Antioxidant) Units of Selected Fruits and Vegetables

Food Source ORAC units of μmol TE/100 grams (3.5 oz)

Fruits	ORAC UNITS /100g	GRAMS to SUPPLY RDI
Bioflavia SO Red Wine Grape Skin Powder* *(Vitis vinifera)	410,000 (4,100 /g)	1.3
Acai berry	26,000 plus	19.2
Acai Fruit pulp & Skin Powder	102,700	4.9
Chinese Wolfberries	25,300	20
Prunes (Dried plums)	5,770–6,552	87
Pomegranates	3,307	151
Raisins	2,830	177
Bilberry	4,460	112

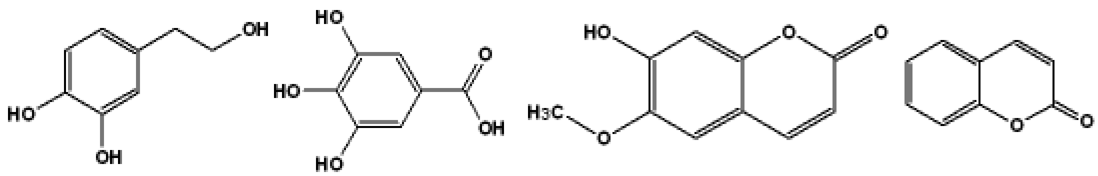
Blueberries	2,400	208
Blackberries	2,036	246
Cranberries	1,750	286
Strawberries	1,540	325
Raspberries	1,220	410
Black Raspberries	7,700	65
Red Raspberries	2,400	208
Plums	949	527
Oranges	750	667
Grapes, red	739	677
Grapes, white	446	1121
Cherries	670	746
Pink grapefruit	495	1010
White grapefruit	460	1087
Apples	218	2294
Banana	210	2381
Pears	134	3731
Watermelon	100	5000

Vegetables	ORAC Units/ 100 g	Grams to Supply RDI
Garlic	1939	257
Spinach	1,770	282
Steamed spinach	909	550
Yellow squash	1,150	435
Brussels sprouts	980	510
Alfalfa sprouts	930	538

Broccoli	880	568
Broccoli flowers	890	562
Beets	840	595
Avocado	782	639
Red bell pepper	710	704
Baked beans	503	994
Onions	450	1111
Corn	400	1250
Peas, Frozen	375	1333
Eggplant	390	1282
Potato	300	1667
Sweet Potato	295	1695
Cabbage	295	1695
Cauliflower	385	1299
Carrot	210	2381
Tomato	195	2564
Cucumber	60	8333

What are phytochemicals?

Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties. They are nonessential nutrients, meaning that they are not required by the human body for sustaining life. It is well-known that plants produce these chemicals to protect themselves but recent research demonstrates that they can also protect humans against diseases. There are more than a thousand known phytochemicals. Some of the well-known phytochemicals are lycopene in tomatoes, isoflavones in soy and flavanoids in grapes and other richly colored fruits.



How do phytochemicals work?

There are many phytochemicals and each works differently. These are some possible actions:

- **Antioxidant** - Most phytochemicals have antioxidant activity and protect our cells against oxidative damage and reduce the risk of developing certain types of cancer. Phytochemicals with antioxidant activity: allyl sulfides (onions, leeks, garlic), carotenoids (fruits, carrots), flavonoids (fruits, vegetables), polyphenols (tea, grapes).

- **Hormonal action** - Isoflavones, found in soy, imitate human estrogens and help to reduce menopausal symptoms and osteoporosis.

- **Stimulation of enzymes** - Indoles, which are found in cabbages, stimulate enzymes that make the estrogen less effective and could reduce the risk for breast cancer. Other phytochemicals, which interfere with enzymes, are protease inhibitors (soy and beans), terpenes (citrus fruits and cherries).

- **Interference with DNA replication** - Saponins found in beans interfere with the replication of cell DNA, thereby preventing the multiplication of cancer cells. Capsaicin, found in hot peppers, protects DNA from carcinogens. **Red Grape Skins** Recent testing by Sun at al suggest that grape skin polyphenols may contribute to the prevention of the metastasis of highly metastatic mammary carcinoma cells. They suggest that their findings may be relevant for breast cancer therapy. (*Sun 2012 antitumor and antimetastatic activities of grape polyphenols in a murine model of breast cancer, Food and Chemical Toxicology 50 (2012) 3462 3467)* T. Sun, Q.Y. Chen, L.J. Wu, X.M. Yao, X.J. Sun

*To quote their summary, "*Although our present findings are not expected to be directly representative of physiological effects because neither the bioavailability nor the systemic metabolism of grape skin polyphenols was taken into account, they suggest that grape skin polyphenols may contribute to the prevention of the metastasis of highly metastatic mammary carcinoma cells. Our results may be relevant for breast cancer therapy"

- **Anti-bacterial effect** - The phytochemical allicin from garlic has anti-bacterial properties.

- **Physical action** - Some phytochemicals bind physically to cell walls thereby preventing the adhesion of pathogens to human cell walls. Proanthocyanidins are responsible for the anti-adhesion properties of cranberry. Consumption of cranberries will reduce the risk of urinary tract infections and will improve dental health.

How do we get enough phytochemicals?

Foods containing phytochemicals are already part of our daily diet. In fact, most foods contain phytochemicals except for some refined foods such as sugar or alcohol. Some foods, such as whole grains, vegetables, beans, fruits and herbs, contain many phytochemicals. The easiest way to get more phytochemicals is to eat more fruit (blueberries, cranberries, cherries, apple,...) and vegetables (cauliflower, cabbage, carrots, broccoli,...). It is recommended take daily at least 5 to 9 servings of fruits or vegetable. Fruits and vegetables are also rich in minerals, vitamins and fibre and low in saturated fat.

Bioflavia SO and **Bioflavia NHP** are excellent sources of Phytochemicals, particularly Antioxidants and can be added to a wide range of foods. Only Organic Red Wine Grape Pomace is used to make BioflaviaSO and Bioflavia NHP. Consumers are encouraged to use a wide range of food sources in order maintain good body health.

The foregoing information is gathered from various industry, university and government sites. ORAC Values will vary depending on how when and where the foods have been grown and processed.

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