

## Ellagic Acid: A Potent Antioxidant and Cell Protectant

Ellagic acid is a naturally occurring phytonutrient that is classified chemically as a phenolic compound. It is found in a variety of fruits and vegetables, but it occurs in particularly high concentrations in red raspberries, strawberries, pomegranates, and cranberries and many other berries, as well as in nuts such as walnuts and pecans. It is present in plants in the form of hydrozable tannins called ellagitannins. Ellagic acid has been shown to inhibit the metabolic activation of toxic compounds into the forms that induce cell DNA damage. Ellagic acid promotes detoxification by stimulating the activity of various isoforms of the enzyme glutathione-S-transferase (an antioxidant enzyme produced by the body). Another mechanism by which ellagic acid may normal cell replication is through its role as a scavenger of reactive oxygen metabolites and free radicals.

## Usage and Safety

This product is suitable for individuals, including vegans, who wish to increase their intake of fruit and berry antioxidant flavonoids and other phenolic nutrients. Mix 1 scoop (6 grams) of powder with 6-8 ounces water, fruit juice or your favorite beverage. **Berry High™** can be blended with liquid, ice and fruits for smoothies, added to cold or cooked cereals, or mixed into hot tea.

## References

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## 100% Natural Phytonutrient Antioxidant Supplement

- Protects Vision, Circulation and Capillary Strength
- Supplies Ellagic Acid, Anthocyanins and Associated Antioxidants
- Activates the Body's Defenses Against Damage to Cellular DNA and Abnormal Cell Development
- Mixes Instantly with Water or Juices for a Delicious Beverage
- Can Be Added to Cereals and Other Foods

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ORAC (Oxygen Radical Absorbance Capacity) Values Provide a Functional Measurement of the Excellent Antioxidant Potency of <b>Berry High™</b> . These High ORAC Values Denote a Slow Aging Process Through Their Antioxidant Properties.	Total ORAC (µmole Trolox)	Water Soluble ORAC (µmole Trolox)	Lipid Soluble ORAC (µmole Trolox)
The ORAC analysis provides a measure of the scavenging capacity of antioxidants against the peroxyl radical, which is one of the most common reactive oxygen species (ROS) found in the body. Trolox, a water-soluble vitamin E analog, is used as the calibration standard and the ORAC result is expressed as micromole Trolox equivalent (µmole TE) per serving.	2238	2220	18

Unfortunately, many of the foods that we normally consume in the belief that they are offering protection are quite poor in antioxidant capacity. Iceberg lettuce, to take one of the most commonly consumed foods, is very low on the ORAC scale: 3.5 ounces of iceberg lettuce supplies less than 150 ORAC units, and some other typical salad vegetables, such as celery and cucumber, are even less good sources of antioxidants. In contrast with lettuce, some fruits and vegetables, such as blueberries and kale, receive quite high marks on the ORAC scale. To achieve a daily intake of 3,000 to 5,000 ORAC units, an individual needs to add only the equivalent of one cup of blueberries — 3,200 ORAC units — to his or her daily diet. The following chart gives the ORAC units supplied by each serving of the berries and other fruits included in **Berry High™**. As a result of **Berry High's** concentration of blueberry, pomegranate, cranberry and other fruits, each 6 gram serving supplies the ORAC equivalent of approximately two thirds cup blueberries.

Some researchers at Tufts suggest that a daily intake of 3,000 to 5,000 ORAC units is a good level to maintain to improve the antioxidant capacity of the blood and tissues. An interesting finding from the ORAC tests is that some foods have stunningly high ORAC values and can be consumed daily in relatively small amounts to achieve the protection which the 36 volunteers gained by increasing their consumption of fruits and vegetables to ten servings per day.

Based upon tests with 36 men and women ranging from 20 to 80 years of age, researchers at Tufts found that the average ORAC value of the five fruit and vegetable servings these subjects normally ate per day was 1,670 ORAC units. In an experiment, these subjects increased their intake to 10 servings of fruits and vegetables per day to supply the equivalent of between 3,300 and 3,500 ORAC units. The result was that blood samples drawn from these volunteers had plasma antioxidant values that were 13 to 15 percent higher than were those drawn from the same subjects after they had eaten their normal diets. An elevation in plasma ORAC capacity of 15 percent is considered to be quite significant because the antioxidant capacity of the blood is tightly controlled and difficult to increase to any large extent.

Not all foods are created equal when it comes to ORAC values. For instance, when tested with eight women volunteers, ten ounces of spinach increased plasma antioxidant values better than did 1,250 milligrams of vitamin C. An eight-ounce serving of strawberries was slightly less effective than the vitamin C, but a little more effective than 9.6 ounces of red wine. Another plus for all three of these foods is that they provide substances useful for purposes other than just antioxidant protection.

High quality antioxidants, similarly, are protective of the health of the eyes and even of the integrity of DNA of the cells. **Jarrow FORMULAS® Berry High™** is designed to help individuals to easily increase their intake of high ORAC antioxidants to take advantage of this proven protection.

## Are Five Servings of Fruits and Vegetables Per Day Enough?



Scientists have gone further than just testing various foods outside of the body, however. The ORAC test has been performed with blood drawn from human subjects to validate that the expected protection actually appears. Moreover, animal studies have shown that antioxidant-rich foods can prevent declines in memory and learning ability and maintain the capacity of the brain to respond to chemical signals, as well as affording protection against damage to the blood vessels.

Studies have shown that an important aspect of the protection afforded by fruits and vegetables derives from the quantity and the variety of antioxidants found in them. Food sources of antioxidants are back in the news because their combinations of antioxidants appear to be more protective than is supplementation with individual antioxidant vitamins. To help quantify this protective value, the Jean Mayer USDA Human Nutrition Research Center at Tufts University utilizes a special test called ORAC (the Oxygen Radical Absorbance Capacity test) to evaluate the capacities of different foods to prevent oxidative damage. The ORAC test yields results in a form sometimes referred to as ORAC "units." These units are calibrated on a scale based upon the antioxidant effects of a special form of vitamin E (Trolox). The more ORAC units found with a test sample, the better that sample is deemed to perform as an antioxidant under defined laboratory conditions.

## Antioxidants: Maximizing Your ORAC Intake