

THE BEST ANTIOXIDANT?

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Glutathione is a chemical compound composed of nitrogen, hydrogen, oxygen, and sulfur and plays a big role in maintenance of metabolic homeostasis in the body on a minute-to-minute basis. In general, it is a strong antioxidant which helps prevent damage to cells by neutralizing free radicals generated while the body burns glucose for energy. It also is useful in processing toxic compounds which are constantly being introduced to our bodies in the urban societies in which we live. It helps in the synthesis of ribonucleic acid (RNA), body proteins, and cellular components. A deficiency of glutathione in the body can be due to a genetic disorder or dietary deficiency.

A brief overview of the chemistry of glutathione reveals that it has certain attachments on the molecule with the ability to reduce free radicals to neutral compounds that cannot harm the body. This process happens as long as glutathione is available. It is not an “essential” nutrient, since the body can make glutathione by a metabolic process from the three amino acids of cysteine, glutamic acid, and glycine. All the cells in the body are capable of synthesizing this antioxidant, but the liver is the most important organ involved in this process. If mice have a genetic loss of their ability to synthesize this antioxidant in the liver, they will die shortly after birth.

It is singularly the major endogenous antioxidant that is produced by your body’s cells. In the absence of exogenous antioxidants, glutathione can maintain a healthy body status on its own. Glutathione helps food with vitamins C and E, in that it maintains the antioxidant ability of these vitamins. It has the ability to detoxify foreign compounds and carcinogens which cause cancer, and also helps detoxify heavy metals such as mercury, lead, and arsenic. This is an essential antioxidant for the immune system and helps promote the body’s lymphocytes, killer white cells, and T-cells, all of which are involved in your immune system. In addition, DNA synthesis and repair such as in damaged skin are under the influence of this as well. It is clear that this is a very complicated process, but it is also enlightening to know that the body’s own “internal computer system” is capable of taking food and turning it into a strong antioxidant. This has relevance when you consider that today’s nutritional supplement market is literally filled with more and more powerful antioxidants that are supposed to maintain the health of your cells, muscles, skin, and the rest of your body. They may not be necessary if a good diet is ingested daily.

How do we get our glutathione levels increased in the body? Direct supplementation of this antioxidant is difficult because it is not well absorbed across the gastrointestinal tract. Even administering a large dose IV of 3 grams of glutathione does not increase circulating glutathione to a clinically beneficial extent. However, vitamin D increases glutathione levels in the brain and appears to be a catalyst for glutathione production. This activated vitamin D in the brain depends on how much vitamin D3 (cholecalciferol)

you have ingested. However, plasma and liver concentration of this antioxidant can be improved by administration of N-acetylcysteine (NAC). Other supplements such as S-adenosylmethionine (SAME) and whey protein will increase glutathione production. Alpha lipoic acid and silymarin, an extract of milk thistle, can both improve glutathione levels.

A low glutathione level is strongly implicated in patients who have a wasting or negative nitrogen balance deficiency such as cancer, AIDS, sepsis, trauma, and burns,. Even schizophrenia and bipolar disorder are associated with lower glutathione levels, and supplementation with NAC has been shown to improve both disorders. Testing glutathione levels is not as easy as getting a simple blood test. It is done by laser scanning microscopy of living cells that have been treated with a fluorescent dye which binds to glutathione. Another way is to use a fluorescent protein dye which can be detected on special imaging. As you can see, both of these are complex tests which are not done in the ordinary laboratory.

So here we are, aware of the most powerful antioxidant in the body which is involved in all of the processes that maintain us as healthy humans, and it doesn't seem to be available as a supplement. What can we do? Interestingly, since vitamin D is involved in the production of glutathione, adding foods that contain vitamin D to your diet would be beneficial; these include salmon, sardines, tuna, eggs, beef liver, cod liver oil, and a plant source, mushrooms. Also, supplementation with some standard antioxidants along with NAC, alpha lipoic acid and milk thistle would help support and raise serum and tissue levels of glutathione on a daily basis. Nutritional support to boost these levels is a useful adjunct in the management of HIV infection, chronic liver conditions, alcohol and drug induced liver damage, and exposure to environmental toxins. It also helps combat the age related decline that occurs after 50. This combination of components is available in a single capsule and may be helpful for treatment of any immune deficiency or metabolic disease. Since fish, meat, and eggs contain sulfur and help in the production of glutathione, at least minimal amounts of these should be eaten.

We do know that in people who are stressed, aging, lacking in sleep, or have a prolonged illness, their bodies utilize glutathione at an accelerated rate, and this results in decreased body stores and weak defenses, and promotes accelerated aging. Supplementation with ordinary foods that contain glutathione such as fruits, vegetables, and meats does not directly raise glutathione levels. Only a small amount of cysteine, NAC, glycine or glutamine actually reaches the blood stream in your body cells after the foods are digested in the GI tract. One supplement called Maxgxl is said to raise intercellular levels of glutathione by an average of 292% with its main ingredient being cordyceps mushrooms. However, this has not been subject to stringent research criteria.

The bottom line is similar to other advice for improving mental acuity, heart disease, prevention of cancer development, and promoting energy levels. That is, eat a good balanced diet such as the Zone Diet, which includes about 30% protein, 30% fat, and 40% good carbs. If you obtain your protein in only plant based foods such as grains, nuts, beans, and vegetables, you will not be able to get the sulfur component which

enhances the production of glutathione. Therefore, maintaining minimal protein levels should include some animal based protein including liver. However, animal based protein only has to be a part of the 30% total protein, much of which you can obtain from plant-based foods. As we have said before, eat a good diet, don't eat too much food, and do not be exposed to toxins such as smoke, pesticides, chemicals, and heavy metals. This will help maintain normal glutathione levels until we really find a way to supplement this.