

## Glutathione Enhancers

Glutathione (GSH) is a tri-peptide consisting of the amino acids cysteine, glycine and glutamine. So anything that will reduce one or all of these three will result in lower levels of GSH. The rate limiting amino acid is the sulfur amino acid cysteine. Many researchers feel GSH is absorbed orally although it becomes quickly degraded. However, it's the intracellular levels we are most concerned about. **To increase intracellular and brain levels of glutathione use extra vitamin C, lipoic acid, NAC and high intake of vegetables, particularly the cruciferous vegetables.** It is also important to have sufficient levels of magnesium, selenium, zinc and other antioxidants. Antioxidants in our diet take a lot of the pressure off the antioxidant enzymes so they don't have to work so hard. Interestingly, the brains of Alzheimer's patients are severely deficient in many essential antioxidants including carotenoids, vitamin C, magnesium, and glutathione. Here are 10 strategies to assist the body's ability to increase glutathione naturally.

- 1) **Moderate Exercise** improves and increases antioxidant enzymes like GSH, peroxidase and catalase. Start slow and build up to 30 minutes a day. Extreme exercise depletes antioxidants and therefore antioxidants should be compensated via diet and supplementation.
- 2) **Lipoic Acid** 100-200 mg, two times a day. Lipoic acid protects as well as crosses the blood brain barrier. It also protects the brain from oxidative damage. It is one of the main factors that Dr. Russell Blaylock recommends to restore brain levels of glutathione. It is also involved in energy production, blood sugar control, brain health and detoxification.
- 3) **N-acetyl-cysteine (NAC)** 500 mg 1 capsule, three times a day, provides sulfur amino acid cysteine, (the rate limiting amino acid). It is also used to treat asthma and lung disease and toxic effects of a Tylenol overdose. Among other qualities it contains antiviral properties. This is another one of Dr. Blaylock's favorites to raise intracellular levels of GSH.
- 4) **Whey Protein Isolate**. 2 scoops per day yield 20 grams of protein and supplies cysteine which is the limiting amino acid for glutathione synthesis. Most whey proteins are processed using technologies which result in the denaturing of the proteins, thereby reducing important biologically active proteins such as lactoferrin (LF), Immunoglobulin (1gG =Immunoglobulin G) and glycomacropetides (GMP). **Whey Protein Isolate** from Biotics Research is produced using a natural, ultra-low temperature micro-filtration method which does NOT denature the sensitive proteins. This process also reduces the allergenicity significantly.
- 5) **Magnesium** is an important intracellular mineral and necessary for healthy mitochondrial function. When magnesium is low, glutathione levels decrease rapidly. 500 mg a day should be the minimum. Take at bedtime and increase to bowel tolerance. **Mg-Zyme** contains 100 mg of elemental magnesium. **Aqua Mag-CI** supplies 200 mg Mg-orate is an intracellular form and although it only contains 31 mg of elemental magnesium per capsule can be very effective when other forms are not producing expected results.

## Tuesday Minute

6) **ProMulti-Plus** 2 capsules, three times a day supplies many of the basics needed to protect healthy antioxidant status. For example, if we are low in vitamins C and E, our GSH stores will be tapped and eventually depleted. If we are low in magnesium, we will be low in GSH. If we are low in selenium, we can't recycle GSH back into its reduced, usable form. Zinc is necessary to make metallothionein which is a natural chelator and spares glutathione.

7) **Eat foods that are high in sulfur** such as garlic, onions, eggs from pastured and cage free birds and the cruciferous vegetables. Here is a list of the common cruciferous vegetables that support liver and gut detoxification as well as provide sulfur. One cup a day is a good goal.

|                         |             |                   |
|-------------------------|-------------|-------------------|
| Black and brown Mustard | Bok Choy    | Broccoli          |
| Brussels Sprouts        | Cabbage     | Cauliflower       |
| Collard Greens          | Horseradish | Japanese Radishes |
| Kale                    | Kohlrabi    | Parsnips'         |
| Radishes                | Rape        | Rutabaga          |
| Turnips                 | Watercress  | Wasabi            |

8) **Reduce Drugs that deplete glutathione** especially acetaminophen or any of its generic cousins. The neurologist, Dr. David Purlmutter, suggests anyone on acetaminophen should embark on a glutathione enhancing program like above.

9) **Reduce other factors that limit or deplete glutathione:** lack of sleep, chronic stress (whether physical or emotional), being overweight, food additives, pesticides, and environmental pollutants, high levels of MSG and excitotoxins. Other factors indirectly deplete glutathione are chronic inflammation, mineral deficiencies, poor digestion (less amino acids), pollution, toxins, trauma, aging, infections and radiation and medications

10) **Methylation (folate and vitamins B6 and B12)** Methylation and the production and recycling of glutathione are the two most important biochemical functions in your body. Methylation nutrients help determine the rate of synthesis of glutathione. Take folate (especially in the reduced forms such as calcium folinate), B6 (in active form of P5P) and B12 (in the active form of hydroxocobalamin). **B12-2000 Lozenges** will supply all three. Take one, three times a day and allow lozenges to dissolve in mouth rather than chew them. Some patients may need **Methylfolate Plus** which is the 5-Methyltetrahydrofolic acid form due to genetic weakness or extreme stress.