What are Endogenous Antioxidants?

Artificial sweeteners, also called alternative, non-nutritive, and low- or no-calorie sweeteners, are a popular ingredient in many foods and beverages. They create a sweet taste by stimulating sweet-taste receptors in the mouth, which then send signals to the brain. Recent research shows that these sweet-taste receptors are also located in other parts of the body like the gastrointestinal tract, pancreas, brain, and fat tissue. This discovery suggests that non-nutritive sweeteners (NNSs) may have broader effects on metabolism, as seen in various lab, animal, and human studies.

Notable Endogenous Antioxidants in Our Body

Glutathione (GSH): GSH has a major impact on a broad range of cellular functions, including modulating numerous signaling pathways, gene expression, immune response, and influences fundamental elements of cellular adaptation to stress.

As an antioxidant, GSH operates in a cycle with enzymatic partners glutathione peroxidase (GPx) and glutathione reductase (GR). This cycle ensures a continuous supply of reduced GSH ready to go to work, and these partners perform together as an antioxidant team, further assisted by nutrient co-factors like exogenous antioxidant micronutrients vitamins B2 and C, and the trace-mineral selenium.

Glutathione S-transferases, though not specifically related to redox reactions, are another class of enzymes requiring GSH to help perform important reactions in the phase II liver detoxification process that allows for toxins and waste product removal.

Superoxide dismutase (SOD): SODs provide a pivotal oxidative defense. Since mitochondrial respiration is responsible for 90% of cellular oxygen use, they are especially at risk for oxidative damage. SODs have been studied extensively for their critical role in endothelial and mitochondrial function, including participation in redox signaling to regulate many vascular functions. Impaired SOD activity has been connected to the following vascular issues: endothelial dysfunction, altered tone, inflammation, remodeling, enhanced permeability, and increased platelet aggregation, which contribute to diseases such as atherosclerosis and hypertension. SODs may also impact renal, hepatic, neurological such as ALS, skin, and other organ functions.

In addition, SODs can be classified into four groups: 1). copper-zinc-SOD1 present in cytoplasm, 2). iron-manganese SOD2 3). Cu-Zn SOD3 in our extracellular spaces, and 4). nickel SOD4 (mainly in plants and prokaryotes). They require the nutrients copper, zinc, iron, and manganese for form and function, and genes encoding for SODs can dictate much about their function.

Catalase: A deficiency or malfunction of catalase, an antioxidant enzyme that mitigates oxidative stress by decomposing cellular hydrogen peroxide (into water and oxygen); has been associated with the pathogenesis of diseases like diabetes, hypertension, anemia, vitiligo, Alzheimer's and Parkinson's disease, bipolar disorder, cancer, and schizophrenia.

Catalase enzymes interact closely with SODs, and, like SODs, also have several different variations. The heme-containing catalase is the most frequently occurring variety. Another manganese-containing catalase variation lacks the heme (iron) group. As you can tell from these basic descriptions, adequate availability of nutrients like iron and manganese will be important to support catalase function.

Conclusion: Endogenous antioxidants are the primary antioxidant systems involved in maintaining redox balance in the body; however, both exogenous and endogenous antioxidants work together synergistically. Dietary or exogenous antioxidants are influenced by both genetic factors (which directly impact endogenous antioxidant enzyme expression and activity), and, environmental factors which add a reactive species burden over time. Ensuring broad micro-nutrient adequacy at physiological levels through a diverse and nutrient-dense diet is important. Adding supplemental antioxidants will also help, especially during periods of increased physical and emotional toxic load.

NH Healthy Guard is manufactured using innovative technology to cultivate wheat, barley, and oat sprouts, and preserve the high activity of superoxide dismutase, catalase and glutathione to provide you with a comprehensive weapon to defend against free radical damage. NH Healthy Guard is also enriched with natural antioxidants vitamins C and E that work synergistically to provide the body with an all-around protection at the cellular and sub-cellular level for processes including membrane (lipid) stability, protein synthesis, and the repair of genetic material.