Chromium

Function:

Chromium is an essential trace mineral that plays an important role in optimizing insulin function and the regulation of blood glucose levels. Chromium may also be anti-atherogenic and assist in lowering cholesterol. Following food intake, blood glucose levels rise causing insulin to be secreted by the pancreas. Insulin lowers blood glucose levels by increasing the rate at which glucose enters a person’s cells. Chromium is believed to facilitate the attachment of insulin to the cell’s insulin receptors. Studies also indicate that chromium participates in cholesterol metabolism, suggesting a role for this mineral in maintaining normal blood cholesterol levels and preventing atherosclerosis. Chromium also plays a role in nucleic acid synthesis.

Deficiency Symptoms:

Due to processing methods that remove most of the naturally occurring chromium from commonly consumed foods, dietary deficiency of chromium is believed to be widespread in the United States. Chromium deficiency may increase the likelihood of insulin resistance, a condition in which the cells of the body do not respond to the presence of insulin. Insulin resistance can lead to elevated blood levels of insulin (hyperinsulinemia) and elevated blood levels of glucose, which can ultimately cause heart disease and/or diabetes. Deficiency of chromium is associated with metabolic syndrome. Metabolic syndrome represents a constellation of symptoms, including hyperinsulinemia, high blood pressure, high triglyceride levels, high blood sugar levels, and low HDL cholesterol levels. These symptoms increase one’s risk for heart disease. Low levels of chromium are also associated with an increased risk of coronary artery disease incidence and mortality.

Chromium deficiency correlates with depressed nucleic acid synthesis. Chromium is essential for maintaining the structural stability of proteins and nucleic acids and animal studies have found that this element is also vital for healthy fetal growth and development. Studies on humans have established that premature infants, and those with evidence of intrauterine growth retardation, have significantly lower chromium status compared to infants born full-term. Others have found that multiparous women (women who’ve given birth two or more times) have far lower body chromium levels compared to nulliparae (women who’ve never given birth). These findings suggest that chromium is an essential trace element during fetal growth and development.

Repletion Information:

In 2001, the Institute of Medicine at the National Academy of Sciences conducted a thorough review of the chromium research and concluded that excessive intake of chromium from foods or supplements is not associated with any adverse effects. As a result, no Tolerable Upper Intake Level (UL) was established for this mineral. However, people with liver or kidney disease may be more susceptible to adverse effects from excessive intake of chromium, and such individuals are cautioned to avoid taking more than 200 micrograms of chromium supplements per day. There is limited evidence to suggest that long term chromium picolinate supplementation at levels greater than 200 micrograms per day may also be hazardous to chromosome integrity and should be avoided.