

Chromium Improves Insulin Sensitivity

Source: Pennington Biomedical Research Center A new study published in February's Journal of Nutrition reports chromium prompts muscles to become more efficient. Researchers found that daily use of chromium picolinate enhanced muscle sensitivity to insulin in obese, insulin-resistant rats. Specifically, chromium improved the ability of insulin, after attaching to muscle cells, to enhance chemical signals in the cell that promoted blood sugar uptake. The study, funded in part by the National Institutes of Health (NIH) and conducted by researchers at Pennington Biomedical Research Center (PBRC), is the first published study using this animal model to demonstrate chromium's action in this way.

“Insulin resistance is a condition in which tissues such as fat and muscle in the body respond poorly to insulin, the major hormone required for glucose metabolism. This condition is present in pre-diabetic states and continues when a person develops diabetes. Previous research suggested that supplementation with chromium picolinate may help improve this condition,” said Dr. William Cefalu, investigator and chief of the division of nutrition and chronic diseases at PBRC. “This animal study is significant because it suggests a more detailed mechanism of action for chromium on improving insulin sensitivity in muscle, a major insulin-sensitive tissue.”

Chromium is one of the few essential trace minerals for which a specific mechanism of action had not been completely identified. This study demonstrated that chromium picolinate helps insulin receptor sites on muscle cells work more efficiently. Insulin receptors on the outer part of a cell allow the cell to bind with insulin in the blood. When the cell and insulin bind, signals within the cell activate “glucose transporters” so that the cell can then take up glucose from the blood and use it for energy. The result was a significantly improved rate at which muscles absorbed glucose from the blood and metabolized it. Impaired insulin action, in the obese rats used in this study, was partially restored with chromium supplementation. In a control group of lean, healthy rats with no abnormalities, chromium supplementation exhibited no observable additional effect on insulin receptor activity.

The study also found that obese, insulin resistant rats treated with chromium picolinate had improved triglyceride and total high-density lipoprotein (HDL) cholesterol ratios. These findings support previous research demonstrating chromium picolinate's potential benefits in reducing cardiovascular risk factors in subjects exhibiting insulin resistance.

“These results add to a growing body of evidence, but more importantly provide a cellular mechanism to explain the effects of chromium picolinate on carbohydrate metabolism,” added Dr. Cefalu. Ongoing research at PBRC is now focusing on the effect of chromium picolinate on cellular proteins associated with insulin function.

About Chromium. Chromium is an essential mineral that is needed for insulin activity in carbohydrate, fat and protein metabolism. In August 2005, the U.S. Food and Drug Administration (FDA) allowed a qualified health claim for chromium picolinate, and

confirmed its' safety. The FDA's ruling was based on the findings of an earlier randomized, double-blind, placebo-controlled trial conducted by Dr. Cefalu that showed chromium picolinate helps to significantly increase insulin sensitivity in those at high risk for diabetes.

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