SUPER Iron COMPLEX

Of all the Irons on the wall, who is the "ferrous" of them all?

When we think of iron (supplemental) we think of fatigue and constipation. And rightly so. When we take too little iron, it can result in low energy, and when we take too much, it can feel like the train's backed up at the station. The solution to this isn't found in taking any more or less iron, resulting in the fatigue/constipation dichotomy, but taking the "right kind" of iron. Bioavailability (the degree at which a drug, nutrient, or other substance is absorbed or becomes available at the site of physiological activity after administration) has a crucial role to play in what an iron supplement can do for you. So, now let us take a sneak peek into what factors are involved in turning an iron complex into a Super Iron Complex.

What does iron do in our bodies?

Iron, *Fe* (element #26 on the Periodic Table) is a transition metal that performs various functions in biological systems. Besides the many biochemical reactions it helps catalyze as a cofactor, Iron plays an extremely vital role in molecular oxygen binding within hemoglobin. Without the proper incorporation of the Iron atom into heme, oxygen could not be carried through the bloodstream and into tissues. More importantly than what Iron does, is how it gets from the food we eat (or the pills we take) to where it's supposed to go in our bodies. The human body runs a very strict Iron management system. With very good reason. As beneficial as Iron is to us, it can become extremely toxic if mishandled. We have specific metallothionines (sulfur containing proteins) that hold onto Iron for safe keeping when not in use. This prevents free floating cationic Iron from floating around and oxidizing the heck out of everything in its path. Not to mention bacteria's need for it in their metabolism. So, proper handling of elemental Iron is a must.

Iron begins its journey from our mouths to the target tissues by first becoming solublized in the stomach. Iron usually enters into the gastric lumen in its oxidized ferric form (Fe^{3+}) where it can precipitate out or chelate to miscellaneous molecules within its grasp. To prevent this unfavorable event from occurring in the stomach, gastric acids, citrate, and sometimes ascorbic acid can help solublize Iron by changing its oxidation state from Fe^{3+}+ to the Fe^{2+} (ferrous) form, thus rendering it less likely to grab onto the nearest molecular species and get carried off to uncharted territory. Iron shortly thereafter gets reoxidized back into its ferric form where it then grabs onto its awaiting chaperone, *transferrin*. This globular protein is Iron's taxi cab that carries the Iron from the mucosal matrix in the duodenum through the bloodstream and into the target tissues. It is within this protein (and others) where the majority of Iron is held when not in biological use.

About the iron in Super Iron Complex

The iron in Super Iron Complex is not just naked ionic iron or in colloid form. Nor is it bound to just any cheap source agent. The iron in Super Iron Complex owes it's one of a kind bioavailability to the compounds it's chelated to. Remember, chelation is when one or more metallic ions (in this case iron) form a non-covalent ligand with an anionic molecule or coordination system. What this means is when one or more negatively charged molecules loosely holds hand with the iron atom in its charged state. The question now is what would be the best chaperone to use to take the iron to where it's supposed to go? Intuition would tell us that the best chaperone would be a species that our bodies recognize as beneficial. One such group of chelating agents is various intermediates of the Krebs Cycle (aka. TCA cycle). These intermediates include oxaloacetate, citrate, isocitrate, succinate, malate, fumarate, and α-keto glutarate. Super Iron Complex has used fumarate, citrate, α-keto glutarate, malate, and succinate as the intermediates of choice. Interestingly, these intermediates can ferry off and do some neat things on their own. In this manner, they too are of some biological importance. It is for this reason, that the body recognizes these intermediates and initiates a warm welcome for them when they're introduced into the body from food. The same goes for certain amino acids. It is suggested that the human alimentary canal is surprisingly set up for the transport of not only mineral-bound Krebs Cycle intermediates, but also mineral-chelated amino acids – namely Histidine within the brush border epithelium of the gut (Glover and Wood, 2008). This

may explain why more and more research is demonstrating a marked increase in the luminal transversion of chelated minerals than their naked ionic counterparts. One factor to take into consideration regarding the intestinal uptake of iron is its oxidation state. This is how positive the charge is on the iron atom**.** It is known from research that iron is absorbed in the duodenum in its ferric (trivalent Fe^{3+}) form (Conrad M.E et al., 1993). But before this happens, it must be solubilized by dissociating from whatever chelating agent it is ligated with. In order for this dissociation to occur, it must be reduced. Although stomach acids are sometimes sufficient to reduce iron to its divalent form, Super Iron Complex has added one of the most efficient reducing compounds known to the vitamin universe: ascorbic acid. Vitamin C not only is actively involved in reducing iron to its ferrous form in the gastric and duodenal lumen, but appears to be one of the main electron donors for duodenal ferric reductase within the transferrin cycle (Atanassova BD et al., 2008). This gives vitamin C a unique dual role. Copper also plays an important role in the uptake of iron. Research gives new insight to a cotransport/co-oxidation shunt between the iron and copper cations (De Silva DM et al., 1995). In fact, it was demonstrated in mammalian intestines deficient in copper, that iron absorption was dramatically reduced and then corrected with copper supplementation (Gubler CJ et al., 1952). Hemoglobin is the primary route in which oxygen is carried through the bloodstream and into the tissues where respiration requires oxygen. Iron lies in the middle of the heme portion of the hemoglobin protein where the oxygen molecule can bind safely while being transported. Since low iron and hemoglobin count are usually the main reasons why people take iron supplements, it would be intuitive to include factors into an iron supplement that would optimize hemoglobin production. Super Iron Complex contains vitamin B12 and folic acid, which have shown in studies to greatly increase hemoglobin synthesis (E.Andrès et al., 2009, Milman N, 2008). Vitamin B6 is also included in the formula due to its required presence as a cofactor in the synthesis of the porphyrin ring system of hemoglobin (Kovler MA et al., 1979).

Purpose

Super Iron Complex is an iron supplement designed for the optimum uptake and delivery of elemental iron to the human body. Backed by scientific research, Super Iron Complex puts iron at its maximum potential, allowing iron to do what it is meant to do.

References

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