

SUPERCHARGE

your body's fat-transporting potential" Super Fat Metabolizer

The human body is a fascinating machine that operates on a very economical fuel source...Fat. What is even more fascinating is how this fuel source is managed within our bodies. Specially designed routes, pathways, transport mechanisms and enzyme networking play critical roles in making this highly efficient energy source available to us to meet our body's demands. Intuition might tell us, "our bodies should automatically know what to do with fat and get it to where it needs to go." In a perfect biological system, yes. However, this may not always be the case.

The Biological Role of Fat

Fats, at least the fats in our bodies, are created and stored in the form of triesters of glycerol and fatty acids called *triglycerides*. They perform various physiological functions depending on the degree and position of desaturation of the fatty acids they contain. For example, a triglyceride can be used as one of the building blocks of cell membranes, adding fluidity or rigidity to a given location on the cell's lipid bilayer. They can also provide fatty acids that are the precursors to lipid-derived autacoids. However, one of the most infamous uses of triglycerides that we are all too familiar with is its use as an energy source. Fat is by far the body's most economical energy source yielding approximately 9 Kcal/g of energy, standing above and beyond the rest of the macronutrients.

There is an issue that now surfaces. Due to the non polar nature of fat (and other lipids) there must be carefully engineered mechanisms that transport and metabolize these hydrophobic molecules in a biological system that is comprised of approximately 80% water. Without these mechanisms, fats and lipids would just clump up together in big gloppy ball and never be any good to anyone. This is where the lipotropic formula of Viva Vitamins' Super Fat Metabolizer comes into play. A lipotrope is an agent that has an affinity toward a lipid resulting in the binding and mobilizing of the lipid out of the liver to prevent its accumulation. Lipid accumulation in the liver without the chaperone role of lipotropes can lead to cirrhosis of the liver and other related problems (E A Sellers, 1948). Furthermore, lipids would not be able to incorporate themselves into cell membranes and perform their physiological functions if it were not for lipotropic agents.

Super Fat Metabolizer

Viva Vitamins has organized an elite group of lipotropes, methylating agents, fatty acids, and vitamins in the Super Fat Metabolizer formula

designed to deal with the issue of lipid management within our bodies and are described as follows:

Inositol is a carbocyclic polyol that is actually not classified as a vitamin since humans can make it on our own, but plays an important role as the structural basis for a number of secondary messengers within our bodies, including inositol phosphates, phosphatidylinositol and phosphatidylinositol phosphate (PIP) lipids. Besides being one of the main lipotropic agents our bodies use, it has also been observed to have similar if not equal beneficial properties to that of anti-depressants without any side effects (Fux M. et al., 1996). A lipotropic formula, of course, would not be a lipotropic formula without choline. Choline is an organic amine grouped with the B-vitamins that is found as a phosphatide linked up to lipids that make up cell membranes. Besides structural integrity of phospholipids bilayers, choline also is required for certain types of neurotransmission and methyl group donating from choline's metabolites. This becomes a "huge" factor in preventing cardiovascular disease via blood titer reduction of homocysteine (Coen DA. et al., 2001). Methionine is an essential amino acid that is an intermediate in the biosynthesis of carnitine, taurine, lecithin, and the majority of phospholipids. The improper synthesis of methionine can not only lead to atherosclerosis (Guthikonda S. et al., 2006), but can impede on the body's potential of creating lipotropic agents. Pyridoxine (vitamin B6) is one of the vitamins involved in treating elevated levels of homocysteine (Miller JW et al., 1994) and has one of the lead roles in the synthesizing of the majority of monoamine neurotransmitters (i.e., serotonin, dopamine, epinephrine and norepinephrine). Chromium picolinate has been strategically placed into the fat metabolizing family due to its insulin super-sensitizing properties. This plays a critical role in fatty acid pharmacokinetics by lipoprotein lipase's dependence on insulin. A deficiency or inactivity of lipoprotein lipase leads to elevated levels of

triglycerides in the bloodstream (Okubo M et al., 2007). We now come to L-Carnitine. This little amino acid has one of the most important roles of all lipotropics in fat burning. Since free fatty acids cannot transverse the mitochondrial outer or inner membranes from the cytosol, carnitine becomes the chaperone. With the help of a series of steps catalyzed by three different enzymes, carnitine drops off the fatty acids inside the mitochondria to undergo β -oxidation and then returns back to the outside to pick up the next load. Research indicates that there are genetic disorders that result in an inability for the body to create sufficient amounts of carnitine (Olpin S, 2005) in which carnitine supplementation may correct for these disorders. L-Phenylalanine is an essential amino acid that plays an interesting role in the weight loss aspect of the Super Fat Metabolizer. Phenylalanine is literally the building block in which the body makes the happy, feel-good neurotransmitters: dopamine and noradrenalin. These catecholamines may give the feeling of satiety resulting in decreased appetite. Our bodies can make many different fatty acids on our own, all except two: linoleic acid and α -linolenic acid, due to its inability to synthesize a double bond beyond the ninth position of a fatty acid. Therefore, we must consume these "essential" fatty acids from dietary sources. Essential fatty acids can greatly contribute to controlling elevated triglycerides when concerned with weight loss and lipid management by reducing postprandial atherogenic particles in hyperlipidemia (Valdivielso P. et al., 2009) doing what even the statins can't! Trimethylglycine (betaine) has been added to the formula due to its relationship to its "kissing cousin" *choline*. Betaine is an osmolyte (regulating osmotic homeostasis in our tissues), a chaperone with anti protein denaturing capabilities, and most importantly, a methyl group donor, converting homocysteine to methionine resulting in a novel agent for preventing elevated homocysteine levels (Holm PI. et al., 2005). Grapefruit powder is also added to the mix due to evidence of its lowering of homocysteine, cholesterol, and saturated fatty acids (Platt R, 2007). Beet leaf powder and black leaf powder has been added as well due to their antihypertensive properties (Andrew J. et al., 2008).

Purpose

Just because our bodies have the ability to turn fat into hormones, cell membrane building blocks, immune signalers, and even energy, doesn't mean the raw material will get expedited as needed the way we think it should. Due to the

chemical characteristics of fat, there need to be helpers available to do this. Lipotropics help to bridge the gap between the hydrophobicity and hydrophilicity in our water-filled bodies. Without a lipid management system, these amazing molecules would not only become useless to us, but could even turn deadly upon accumulation. Researchers at Viva Vitamins have isolated the best nutrients that can get this job done and incorporated them into the new Super Fat Metabolizer.

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