

Stearic Acid... Is It Safe?

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In an age when information is at our fingertips, it's essential to stay up to date on literature, but MORE importantly, to discern the credibility of ANY source. For example, we have heard from various nutrient manufacturers that the use of magnesium stearate can cause suppression of T-cells and may lead to impaired membrane integrity. More recently, a few clinicians have stated that stearic acid can encourage the creation of biofilms.

Biofilms are an accumulation or breeding ground of microorganisms where bacteria, viruses, fungi and/or protozoa are embedded in a polysaccharide matrix and attach to either solid biological or non-living surfaces. Biofilms are an important field of study. It appears the most resistant bacteria or fungal strains can exist in matrix like pockets of biofilm.

So every clinician needs to ask, are these claims based on science or opinion? It's unfortunate, but it's also necessary to also ask: are these claims designed



to add a marketing advantage to the companies who promote their validity?

Lest I leave you hanging, let me give you the short version. Magnesium stearate and stearic acid have not been shown to cause immune suppression in any human trials. And stearic acid has actually been shown to REDUCE the incidence of biofilms.

What is stearic acid and how prevalent is it? Stearic acid is one of the most common of the long-chained fatty acids. It is an 18 carbon saturated fat and is found in significant amounts in meat, poultry,

fish, eggs, butter, grains, and milk products.

Just to give you an idea, chocolate contains cocoa butter, which is high in saturated fat. About a third of the fat in chocolate is in the form of stearic acid. A person who eats a chocolate bar will ingest hundreds of times more stearic acid than someone taking a dietary supplement with magnesium stearate.

Magnesium stearate is a salt containing two parts stearate and one part magnesium. Our bodies make magnesium stearate naturally in our digestive tracts. Magnesium, which has a

positive charge, frequently attracts stearate which is a negatively charged ion.

But let's look into why someone would say "that stearic acid has been reported to suppress the action of T-cells." The Journal of Immunology published an article by Tebbey and Buttke in 1990. "In vitro" is Latin for glass. In this "in vitro" study it was demonstrated that T-cells are lacking enzymes which precludes them from desaturating or breaking down stearic acid. Researchers postulated that feeding T-cells large amounts of stearic acid may lead to impaired membrane integrity. Furthermore a large feeding of stearic acid to T-cells could lead to a loss of membrane potential and loss of cell function and viability.

Let's look closer at this study which has been used to make the claim that stearic acid is toxic and supplements that contain stearic acid and/or magnesium stearate are therefore toxic. Most people are not trained in toxicology. Toxicology is a field of science that explores the relationship of effects caused by various doses of ingredients to cells and organ function.

The "in vitro" or what I call the test tube method allows the incorporation of very large doses of substances that may not represent the "in vivo" or the "living" condition. For example every dietary mineral can be shown to be toxic by "in vitro" analysis. A scientist can increase potassium to 1000 times its normal amount in cell function by "in vitro" testing and report the toxic effects of potassium. Anyone using an "in vitro" potassium report could claim that "this dietary supplement contains potassium which has been shown to be toxic." Even the general observer knows that too much of any substance or mineral will normally cause an imbalance in any living system.

Let's consider biofilms for a minute. Certain molecules called autoinducer-2 are used by microorganisms to modulate biofilm formation among other activities.

Here's a study that shows stearic acid in high doses actually hinders biofilm development. The Journal of Food Protection in 2008 published an article "Identification of Ground Beef-Derived Fatty Acid Inhibitors of Autoinducer-2-Based Cell Signaling." Gas chromatographic analysis revealed the presence of several fatty acids such as palmitic acid, stearic acid, oleic acid, and linoleic acid were capable of inhibiting autoinducer-2 activity.

Of course, these fatty acids were tested at different concentrations, high to low, to identify differences in the level of autoinducer-2 activity inhibition. Inhibition ranged from 25 to 90%. Small amounts of stearic acid or magnesium stearate may not inhibit biofilms but certainly will not contribute to their growth.

So, getting back to the supplement industry, just how much stearic acid are we talking about? The amount of stearic acid or magnesium stearate in a tablet is generally no more than 0.5%. This means that a single 1000 mg tablet would supply 5 mg of stearic acid. In comparison, in its natural form, one soft gel of flax seed oil contains 14 mg of stearic acid. Stearic acid occurs naturally in flax seeds and many plant oils. Most manufactures select a vegetable source grade, generally palm oil of stearic acid. I have included the references for the negative "in vitro" source below as well as some additional references that highlight the positive effects of stearic acid.

I hope this discussion will help you discriminate some of the marketing hype for your own personal health selections and help you discuss these issues with your clients. It's nice to have answers like this on hand before questions come up. It's my opinion that magnesium stearate, when used appropriately is safe; and once you look closely, I think you'll agree.

Thanks for reading this week's edition and I'll see you next Tuesday.