

The background of the entire page is a vibrant blue. In the upper right, there is a large, fluffy pile of white powder. In the lower center, there is a cluster of approximately ten white, round tablets. The text is overlaid on this background.

Stearic Acid & Magnesium Stearate: **EXAMINING** THE

Perhaps you've read or heard that stearic acid and magnesium stearate are undesirable substances to be included in dietary supplements. Certainly the internet is rife with articles and blogs indicating that these substances are harmful, as well as articles and blogs refuting those claims. So, what is true? Let's examine the facts.

We'll begin by defining stearic acid and magnesium stearate. Stearic acid is a saturated fatty acid found in many foods including animal and vegetable fats and oils.¹ Cocoa² and flaxseed³ are examples of foods that contain substantial amounts of stearic acid. Magnesium stearate is a magnesium salt of stearic acid. In other words, it

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FACTS

is a compound containing two stearic acids and one magnesium.

The Fate of Stearic Acid & Magnesium Stearate in the Body

In the body, stearic acid is primarily converted into oleic acid (a monounsaturated fatty acid).⁴ Oleic acid comprises the majority of olive oil, and may also be found in substantial quantities in grape seed oil, sea buckthorn oil and the açai berry.^{5,6} In addition, oleic acid may be responsible for the blood pressure reducing effects of olive oil.⁷ Consequently, even though stearic acid is a saturated fat, studies have suggested that it has no negative effect on blood cholesterol levels since such a high proportion is converted to oleic acid.⁸ In fact, some research even indicates that stearic acid actually lowers LDL cholesterol.⁹

After magnesium stearate is broken back down into its component parts in

the body, its fat is essentially the same as that of stearic acid. The magnesium part of it can be used to supply the body with this essential mineral.

Using Them in Dietary Supplements

Stearic acid is commonly used as a binder in tablets (think of how you might use eggs as a binder to mix with flour during baking). It also has lubricant properties. Magnesium stearate is a lubricant, and the most common ingredient used in tablet formulations. After achieving a homogenous blend of powdered ingredients, a small amount of magnesium stearate is added to enable the powder blend particle surface to be sufficiently coated while limiting penetration of the lubricant within the particle matrix.¹⁰ This will allow tablets to be punched without sticking to the machinery, or capsules to glide shut easily and eject from the machinery.

It should be noted that the amounts of stearic acid and magnesium stearate typically used in a tablet is relatively minute. Stearic acid typically ranges

between 0.5-10 percent of the tablet weight, while magnesium stearate typically represents 0.25-1.5 percent of the tablet weight.¹¹ Therefore, in a 500 mg tablet, the amount of stearic acid would probably be about 25 mg, and magnesium stearate about 5 mg.

Alleged Problems

There are a few alleged problems with the use of stearic acid and magnesium stearate in dietary supplements. The first is that magnesium stearate will interfere with absorption of the nutrients in the tablet. Supposedly, magnesium stearate promotes the growth of gastrointestinal bacterial colonies, which in turn create a biofilm that prevents the absorption of nutrients. While it is true that some bacteria form biofilms on surfaces to protect themselves from antimicrobial attack, it is also true that biofilms help the bacteria to communicate, colonize, defend against competitors, adapt to changing environments and are vital to our human microbiota (i.e., not all biofilms are bad).¹² In any case, the problem with the allegation that there is no research suggesting or proving biofilms occur in humans with ingestion of magnesium stearate, although there is a laboratory study that found stearic acid to *inhibit* the formation of biofilms.¹³

In any case, this concept loses credibility when you consider how easy it would be to consume far more stearic acid in a regular meal than you would in a dietary supplement tablet. For example, if you ate a piece of roasted chicken [chicken thigh, meat only (skin removed), roasted], you'd get about 359 mg of stearic acid.¹⁴ Likewise, if you ate half of a bar of milk chocolate (about 112 calories), you'd get 1,283 mg of stearic acid. Also, according to Consumerlabs.com, USDA (U.S. Department of Agriculture) nutrition surveys indicate that the average American adult consumes between 5,900-8,800 mg stearic acid each day (typically from food sources like beef, poultry, cocoa butter, milk and cheese). So, if you were to follow this concept to its logical conclusion, you'd have to avoid all food that contains stearic acid when you take your supplements. Clearly this makes no sense. People routinely take their supplements with meals, yet they still absorb the nutrients provided by those supplements.¹⁵ So compared to hundreds of milligrams of stearic acid in a meal, what's the big deal

about 5-25 mg of magnesium stearate or stearic acid in a supplement? Answer: there is none.

Another alleged problem with stearic acid and magnesium stearate in dietary supplements is concerns about their potential negative effect on immunity. The primary source for this concern is a scientific journal article, "Molecular basis for the immunosuppressive action of stearic acid on T cells."¹⁶ This article reports an *in-vitro* experiment where stearic acid suppressed the immune activity of T cells. In reading this article, it is important to consider a few things. First, T-cells lack the enzymatic machinery to metabolize stearic acid, which makes the findings of that study a bit suspicious.¹⁷ Secondly, the total concentration of free fatty acids in the plasma of a healthy adult is about 100 times less¹⁸ than the amount of free stearic acid it took to kill the T-cells *in vitro*. In other words, this couldn't happen in real life.

So what does happen when stearic acid is provided to humans in normal amounts? In one study, immune competence was tested by a battery of T- and

B-lymphocyte stimulation tests and also by natural killer (NK) cell activity in a group of 94 men receiving different fatty acids, including stearic acid. The results were that stearic acid was found to have a positive effect on immunity, particularly NK cell activity.¹⁹ In any case, whether the effects on immunity were positive or negative, the amount of stearic acid and magnesium stearate found in dietary supplements is still too insignificant to matter.

It is interesting to note that research in rats found that even when magnesium stearate was fed to them in quantities representing five percent of their diet, there were *no negative effects*. Harm to the rats occurred only when the magnesium stearate was increased to 10-20 percent of their diet. (Just to be clear, five percent of their diet corresponds to 2,500 mg/kg of body weight per day.²⁰) Of course, too much of *anything* is not good for you, but in order to consume such large amounts of magnesium stearate from supplements, humans would have to take thousands of capsules/tablets daily. This is some-

thing that even the most ardent supplement user could not achieve—although if they could, the animal research suggests that even at five percent of the diet, there would still be no harm (at least from the magnesium stearate).

Conclusion

There does not appear to be any advantage to avoiding stearic acid and magnesium stearate in dietary supplements. The objections raised are not borne by research. Both of these substances are safe and essentially harmless in the amounts used in dietary supplements. Furthermore, if magnesium stearate is eliminated from the tablet/capsule manufacturing process, the machines used to produce them will have to do smaller runs and be cleaned more frequently to avoid gumming up the works. The result will be an increase in labor and costs. Naturally, those costs will be reflected in the price of the finished product. That's an unnecessary price increase considering there is no value in avoiding magnesium stearate or stearic acid in the first place. **VR**

(Please see page 56 for references.)

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