

Is Magnesium Stearate A Harmless Additive?

What Is Magnesium Stearate?

Magnesium stearate is a salt that is produced when a magnesium ion bonds with two stearate molecules. Stearate is the anion form of stearic acid, a long-chain saturated fat that is abundant in beef, cocoa butter, coconut oil and other natural foods. It is the only long-chain saturated fat that scientists and medical practitioners agree doesn't raise cholesterol levels and doesn't increase risk of heart disease.

Stearic acid is also a common fatty acid found in meat, poultry, fish, grains, eggs, butter, and milk products. In meat, it is 1/3 of the saturated fat. The average intake of dietary stearic acid in American women is 5700 milligrams daily and in men 8400 milligrams daily. The amount of stearic acid ingested in a vitamin product is a small percent of a fatty acid that you consume every day as part of your diet, a type of fatty acid that is not problematic in the first place.

Magnesium stearate is commonly used in drug and supplement manufacturing as a "flow agent," which helps ensure that the equipment runs smoothly and the ingredients stay blended together in the correct proportions to insure uniform dose units.

Given the seemingly benign components of this additive, it appears any concern regarding magnesium stearate is unfounded.

Effect On Immune Cells

One study that has been cited against the use of magnesium stearate is a 1990 experiment entitled "Molecular Basis for the Immunosuppressive Action of Stearic Acid on T-Cells." In the experiment, scientists isolated T-cells and B-cells from mice, put them in a Petri dish and bathed them in a solution containing stearic acid. They observed that the T-cells incorporated the stearic acid into their cell membrane, eventually destabilizing the membrane enough that the cell died.

This study has no relevance to human consumption of magnesium stearate because:

First, this study has nothing to do with magnesium stearate. The researchers used plain stearic acid that you'd find in your beef, chocolate, or coconut oil, so this study could just as easily be used to propose that beef, chocolate or coconut oil are damaging and should be avoided.

Second, the study has nothing to do with stearic acid consumed in the diet. Under normal conditions, your T-cells are not bathed in stearic acid, even if you consume superhuman amounts of coconut oil, tallow and cocoa butter.

The researchers used T-cells from mice and the results cannot be applied to humans. The mouse cells incorporated stearic acid into their membranes because they lacked the ability to unsaturate fatty acids. However, human T-cells do have the ability to unsaturate fatty acids, so

even if you did bathe your T-cells in stearic acid, they would be able to maintain their membrane function.

Is Magnesium Stearate Toxic?

Magnesium stearate and its parent compound stearic acid are both US FDA approved ingredients with GRAS status (“generally recognized as safe”). In order to maintain this classification, updated toxicology reports are filed and no evidence has been found to show toxicity or safety concerns. Marketers, however, target one in vitro study by Tebbey and Buttke, which showed that feeding large amounts of stearic acid may lead to an impaired cell membrane integrity. The in vitro method of testing allows the cell to be exposed to an inordinate amount of the substance relative to an in vivo experiment. In such an experiment, any substance would become “toxic”, which renders this study inaccurate. In vivo studies are preferable in the fields of medicine, nutrition and toxicology.

On the contrary, multiple studies have shown some benefit to stearic acid, including activating neutrophil function. Results from another study indicate that stearic acid (19g/day) in the diet has beneficial effects on thrombogenic and atherogenic risk factors in males. Also, foods high in stearic acid favorably affected blood lipids and factor VII coagulant activity in young men, according to another study.

Pesticides and GMOs

Another criticism is that because stearate is often derived from cottonseed oil, it can be contaminated with pesticides. Magnesium stearate is a highly purified substance and goes through an intensive refining process before appearing in supplements. I am unaware of any reports indicating that magnesium stearate retains significant amounts of pesticide residue.

As for the concern that cottonseed oil is often genetically modified, the source of crude fat shouldn't make a difference in the final form of the stearate. Stearic acid is an 18-carbon molecule with a specific chemical structure that will be the same whether the stearic acid is from a genetically modified cotton plant, a bar of Hershey's chocolate or a grass-fed rib-eye steak.

Effect On Nutrient and Drug Absorption

Another criticism is that magnesium stearate might inhibit nutrient absorption. One in vitro study conducted in 2007 found that tablets containing magnesium stearate dissolved more slowly than tablets without magnesium stearate when placed in artificial gastric juice. The study authors concluded that in vivo studies are needed to determine whether this finding has any practical significance. However, an earlier study found that although magnesium stearate increased the time it took for a drug to dissolve, *it had no effect on overall bioavailability*, as evidenced by blood levels of the drug in test subjects. Another study found that levels of magnesium stearate didn't affect tablet dissolution at all.

All of this indicates that although magnesium stearate might affect the rate of tablet dissolution in some circumstances, *it doesn't affect the overall bioavailability* of the drug or supplement.

Biofilms

Some critics of magnesium stearate claim that it can induce formation of harmful biofilms in the intestine. This assertion appears to be based on the fact that soap scum contains magnesium and calcium stearate, so they insist that just as soap scum creates films on your sink or shower, magnesium stearate creates films on your intestines. There is no conceivable reason why this would take place. I haven't seen a study that even hints at this possibility.

Allergies

Finally, a rat study determined that you'd have to take at least 2500 mg daily of magnesium stearate per kilogram of body weight to see toxic effects. That means a 150 lb person would have to consume 170,000 mg, which would mean taking *cases* of supplements daily. The amount of magnesium stearate contained in one dose is miniscule.

How Much Magnesium Stearate is Found in Capsules Is Relative to What is Found in Foods?

The amount of magnesium stearate in a tablet or capsule is generally no more than 0.5%. This means that a single 1000 mg dosage would supply 5 mg of stearic acid. One tablespoon of sunflower oil contains 588 mg of stearic acid. To get the equivalent of stearic acid found in one tablespoon of sunflower oil, a patient would need to consume over 100 tablet or capsules. In another example, where one tablespoon of coconut oil contains 381 mg of stearic acid, a patient would need to take over 75 tablets or capsules to equal the amount in the coconut oil. Without belaboring the point, the amounts of magnesium stearate or stearic acid found within the dietary supplement is inconsequential, particularly when compared to what is found naturally-occurring in common foods.

In summary, I am unaware of any scientific evidence to substantiate the claims against magnesium stearate. The micro amounts found in supplements should make it a non-issue. This appears to be another case of someone looking for some reason to use to set themselves apart from their competition but their reasoning is not supported by evidence.