



Oxalic acid in star fruit can kill kidney patients

In 2003 we wrote an article for the Honolulu Star-Bulletin about how star fruit (also known as carambola) can be potentially deadly for people with impaired kidney function. At that time, researchers were not sure why star fruit was causing such serious reactions in people. The suspect substance was oxalic acid, but there was speculation that a neurotoxin was also present. After nine years, additional research points to the oxalic acid in star fruit as the sole culprit.

QUESTION: What are the symptoms of star fruit toxicity?

ANSWER: In people with compromised kidney function, symptoms occur within one to five hours after eating the fruit. Typical symptoms include persistent hiccups, nausea, vomiting, agitation, insomnia, mental confusion and convulsions. Death has occurred in some cases.

Q: How much star fruit needs to be consumed to produce toxic effects in kidney patients?

A: As little as one-half of a fruit and less than eight ounces of star fruit juice has been shown to cause serious symptoms. One person died from eating just one star fruit.

Q: Do other common foods contain as much oxalic acid as star fruit?

A: Yes. Some foods that contain twice as much oxalic acid as star fruit, ounce for ounce, include parsley, chives, purslane, cassava, amaranth and spinach. Foods that contain similar amounts of oxalic acid include beet leaves, carrots, taro leaves, almonds, radishes, collards, rhubarb and monstera fruit.

Q: Why don't these other high oxalic acid foods seem to cause the same problems as star fruit?

A: It is possible that some of them could cause the same problems if great enough amounts were consumed. However, there are a variety of factors that can reduce the toxicity of oxalic acid. For example, boiling vegetables causes much of the oxalic acid to be released into the cooking water. If the cooking water is not consumed, the vegetable will provide significantly less oxalic acid.

In addition, oxalic acid is not always present in foods in its acid form. When this compound is bound to calcium or magnesium, it is called calcium or magnesium oxalate. This form of oxalate does not get absorbed into the body in significant amounts like oxalic acid. Consequently, consuming foods with a high oxalic acid content along with high-calcium foods can greatly reduce absorption of the oxalic acid. Milk, hard cheeses and

yogurt are examples of naturally high-calcium foods.

Additionally, the oxalic acid content of a particular plant food can vary greatly due to differences in cultivars, growing conditions and plant maturity. Therefore, it is possible that even a food like star fruit may sometimes have low or high levels of oxalic acid.

Q: Are high-oxalic acid foods a problem for people with normal kidney function?

A: Normal, healthy people generally tolerate high-oxalate foods well. However, some people are predisposed to forming kidney stones composed of calcium oxalate. These individuals can benefit from limiting their intake of high-oxalic acid foods.

Even though calcium is part of the calcium oxalate stones, adequate calcium intake helps to reduce the absorption of oxalate and reduces the risk of stones forming. It is important to keep in mind that, as with most nutrition issues, balance is important. Excessively high calcium intake has been shown to increase the risk of kidney stones. A table of the oxalic acid content of foods is available at oxalacidinfo.com.

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