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Tomatoes popular, but power to boost health not definite

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This just in: Organic tomatoes have more lycopene than conventionally farmed tomatoes. This also just in: Lycopene might not be as healthful as we thought. So goes the bold field of tomato research.

As the most frequently consumed produce in America after potatoes, tomatoes provide vitamins, minerals and fiber -- and, of course, they're nonfat. Plus, with high levels of the antioxidant lycopene, they've been considered a potentially powerful cancer fighter.

But even as new research identifies which growing methods produce the most lycopene-rich tomatoes, the Food and Drug Administration has said the fruit's health-boosting powers can't be proved.

In a review published in the July 18 issue of the Journal of the National Cancer Institute, researchers at the FDA explain the agency's 2005 decision not to allow beyond-a-shadow-of-a-doubt health claims for tomatoes.

UNCONVINCING

The FDA looked at 64 studies of tomatoes and cancer, and 81 studies of lycopene and cancer, and found the majority didn't make a convincing argument either way. The agency can ban a claim when there is "no credible evidence" published to support it or when stronger evidence contradicts those findings.

But it has strict requirements for what constitutes "credible" evidence, and only a small percentage of the studies fits that description.

None of the 81 lycopene studies were judged by the FDA to support the cancer prevention claims. The studies either used tomato consumption instead of blood lycopene levels or they measured these levels only once. Tomato intake can't be used to infer lycopene intake, because the amount in every tomato varies, depending on how the food has been stored, prepared and consumed.

For starters, different strains of a vegetable or fruit produce different amounts of antioxidants. Lycopene, for example, is not present in green or yellow tomatoes. And if a tomato is cooked and mashed, lycopene is absorbed by the body more readily than if it's eaten raw and whole. Absorption also improves when the chemical is consumed with fats.

MORE FLAVONOIDS

How the tomatoes are grown also might matter. A study published June 23 in the Journal of Agricultural and Food Chemistry found that tomatoes grown using organic farming techniques produce more flavonoids, which have similar antioxidant properties to lycopene (lycopene is technically a carotenoid, not flavonoid) than do conventionally farmed tomatoes. Organic tomatoes expend less energy metabolizing nitrogen from fertilizer, and more on making antioxidants, than their conventional counterparts, the researchers said.

Regina Ziegler, a senior investigator in the division of cancer epidemiology and genetics at the National Cancer Institute, says a study of a lycopene supplement could prove the chemical's health benefit. But the National Institutes of Health, which often funds such research, would need strong evidence from small studies before launching such a project, she said.

"You can't argue that there are things other than tomatoes in tomatoes," Ziegler says.

If lycopene is just one of several compounds in tomatoes that reduce cancer risk, studies of the fruit itself should be more promising. But of the 64 tomato studies, 25 were rejected by the FDA because they reanalyzed old data or measured chemical biomarkers rather than actual cancer incidence.

The remaining 39 studies looked at nine cancer types, including 13 on prostate cancer, the type for which the lycopene link was first hypothesized. Even for this most well-studied cancer type, only two of the 13 showed a strong preventive effect from tomatoes.

None of the few studies on endometrial, cervical and colorectal cancer indicated a preventive effect for tomatoes. In gastric, pancreatic, prostate and ovarian cancer studies, subjects who ate tomatoes showed slightly lower incidences of cancer recurrence but not in great enough numbers to gain any but the lowest of the FDA's four strength-of-evidence ratings. "The FDA," Ziegler says, "is setting the bar very high . . . and maybe that's not incorrect."

A SURROGATE

Perhaps studying tomatoes alone narrows the dietary focus too much. "Why is it that men who eat more tomato sauce get prostate cancer less often -- is it that they eat more pasta than they do big slabs of meat?" asks Cheryl Rock, a professor at the Moores Cancer Center at the University of California, San Diego. "It could be that lycopene (or tomatoes are) a surrogate for something else."

John Pierce, also a professor at Moores, says, "It's undoubtedly the combinations people are eating and not a single food."