



News Release

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STANFORD STUDY DRIVES STAKE THROUGH CLAIMS THAT GARLIC LOWERS CHOLESTEROL LEVELS

STANFORD, Calif. — When it comes to lowering cholesterol levels, garlic stinks, according to a new study from the Stanford University School of Medicine.

Despite decades of conflicting studies about the pungent herb's ability to improve heart health, the researchers say their study provides the most rigorous evidence to date that consuming garlic on a daily basis—in the form of either raw garlic or two of the most popular garlic supplements—does not lower LDL cholesterol levels among adults with moderately high cholesterol levels.

“It just doesn't work,” said senior author Christopher Gardner, PhD, assistant professor of medicine at the Stanford Prevention Research Center. “There's no shortcut. You achieve good health through eating healthy food. There isn't a pill or an herb you can take to counteract an unhealthy diet.”

Gardner said the study, which will be published in the Feb. 26 issue of the *Archives of Internal Medicine*, is the first independent, long-term, head-to-head assessment of raw garlic and garlic supplements. The study also drew on the expertise of two of the nation's foremost garlic experts—Larry Lawson, PhD, of the Plant Bioactives Research Institute in Utah, and Eric Block, PhD, professor of chemistry at the State University of New York-Albany—who have devoted much of their careers to understanding the biochemical properties of the herb and who ensured the quality and stability of the garlic consumed in the study.

“If garlic was going to work, in one form or another, then it would have worked in our study,” Gardner said. “The lack of effect was compelling and clear. We took cholesterol measurements every month for six months and the numbers just didn't move. There was *no* effect with any of the three products, even though fairly high doses were used.”

Most of the medicinal claims about garlic revolve around the sulfur-containing substance allicin, which is produced when raw garlic is chopped or crushed. Allicin has been shown to inhibit the synthesis of cholesterol in test tubes and in animal models, but there is conflicting clinical evidence about its ability to react inside the human body the same way it does in a lab dish.

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“In lab tests, you can apply the garlic compounds directly to cells,” Gardner said. “But in real people you don’t know whether allicin would actually get directly to cells if someone ate garlic. You still have to do the human clinical trial to see if it really works, and the previous clinical trials left people confused.”

Indeed, the fact that allicin had positive results in some lab tests and animal studies made it possible for supplement makers to tout garlic as a natural remedy for high LDL cholesterol levels. LDL cholesterol is known as the “bad cholesterol” because when too much of the substance circulates in the blood, it can build up and clog arteries, increasing the risk of heart attack or stroke. LDL levels of less than 130 mg/dl are considered optimal, while levels greater than that are considered high.

For the study, the researchers recruited 192 patients with moderately elevated LDL cholesterol levels, with an average level of about 140 mg/dl. “These are the people who are the most likely to use supplements,” Gardner said. “If their cholesterol were higher, then their doctors would be putting them on statins or some other prescription medication.”

The study participants were then randomly assigned to ingest either raw garlic, an aged garlic supplement, a powdered garlic supplement or a placebo six days a week for six months. For those assigned to take either raw or supplemental forms of garlic, each participant consumed the equivalent of a 4-gram clove of garlic per day (which the researchers determined was the average size of a clove of garlic). For those assigned to the supplements, this meant taking somewhat more than the dosage recommended on the packaging instructions for both supplements.

The garlic supplements used in the study are two of the top sellers, but are manufactured in very different ways. Gardner said that the manufacturer of the aged garlic extract calls it “the ‘sociable’ garlic because they say the aging process takes away the bad-breath aspect.” Extensive chemical analyses of the three garlic products confirmed that the daily doses represented similar amounts of the original starting material and that all three remained stable over the course of the study.

All of the study participants were given tablets as well as sandwiches prepared by Gardner’s team. For those assigned to consume raw garlic, the garlic was mixed into the sandwich condiments, and the pills were placebos. For those assigned to take supplements, the condiments were garlic-free. In all, the research team made more than 30,000 gourmet sandwiches for the six-month study.

Participants were closely monitored throughout the study to ensure that they didn’t gain or lose weight, which might have affected their cholesterol readings. Additionally, blood samples were taken monthly from the study participants.

When the researchers tested the blood samples, they found that the LDL cholesterol readings remained nearly identical from start to finish.

“Our study had the statistical power to see any small differences that would have shown up, and we had the duration to see whether it might take a while for the effect of the garlic to creep in. We even looked

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separately at the participants with the highest vs. the lowest LDL cholesterol levels at the start of the study, and the results were identical,” Gardner said. “Garlic just didn’t work.”

One potential reason for the confusion surrounding garlic’s reputed health benefits is that the supplement makers themselves funded many of the previous studies claiming that garlic lowered cholesterol. Gardner’s funding came from the National Institutes of Health.

Gardner said garlic may still have an effect on other health and disease processes that were not addressed in this study, such as inflammation, immune function or cancer. But, he added, those potential benefits also need to be studied in rigorously controlled trials.

He also said that garlic can still be a valuable part of the diet if it’s used to increase the consumption of healthy dishes, such as a stir fry or a Mediterranean salad. “But if you choose garlic fries as a cholesterol-lowering food, then you blew it. The garlic doesn’t counteract the fries,” Gardner said.

The other Stanford co-authors of the study include study coordinator Lorraine Chatterjee; postdoctoral scholar Alexandre Kiazand, MD; statistical programmer Raymond Balise, PhD; and professor of biostatistics Helena Kraemer, PhD.

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