

Milk wrecks the health benefits of tea

- [00:01 09 January 2007](#)
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- Those looking for an antidote to holiday overindulgence may have added “drink more tea” to their lists of New Year’s resolutions, given past studies linking the drink to health benefits. But new research indicates this could all be in vain if you add a splash of milk.

German researchers have found that the relaxing effect of a few cups of ordinary black tea on the arteries is completely wiped out by milk.

After water, tea is the most widely drunk beverage in the world, and is increasingly popular in countries such as the US after reports that people who drink more tea have less cardiovascular disease and cancer. But these effects have been seen most clearly in east Asia, not in tea-loving countries such as the UK.

“That could be because there they almost always drink tea with milk,” says Verena Stangl of the Charité Hospital in Berlin. She and her colleagues found that when middle-aged women drank half a litre of black Darjeeling, their arteries relaxed much more in response to artificially increased blood flow than without the tea. This ability prevents cardiovascular problems, and depends on eNOS, an enzyme that synthesises the chemical messenger nitrous oxide.

Underlying effects

They found that tea also relaxed rings of rat aorta in the lab, and increased the activity of eNOS in cultured arterial cells fourfold. But when the tea had 10% of skimmed milk in it, it had none of these effects in women, rat aortas or cells.

Dissecting this further, the team found that casein proteins from milk blocked the effect of tea all by themselves. These proteins bind specifically to tea chemicals which cause rat aorta to relax, and especially a catechin called EGCG. Catechins are a kind of polyphenol, a group of chemicals long thought to underlie tea’s healthful effects.

Researchers in the past have claimed that milk had no effect on tea because it does not change overall concentration of polyphenols in the blood. But, Stangl told **New Scientist**, what is important are specific polyphenols, such as EGCG – and milk does block those. “It probably also blocks tea’s effect on other things, such as cancer,” she says.

The group is now looking at whether green or black tea is better for you. Previous studies may have been confounded by the fact that black tea is often drunk with milk, while green tea is not.

Journal reference: *European Heart Journal* (DOI: 10.1093/eurheartj/ehl442)

Green tea can be harmful in large quantities

- [10:00 05 May 2007](#)
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Green tea is good for you, but only if drunk in moderation. While the polyphenols in green tea are credited with preventing heart disease and cancer, it seems they can cause liver and kidney damage if consumed in very large quantities, a review of studies into the toxicity of polyphenols has shown.

“People shouldn’t be too alarmed by this, but those taking supplements may experience problems,” says lead author Chung Yang of Rutgers, the State University of New Jersey.

He stresses that up to 10 small cups of green tea a day is fine. Problems are likely in people who take supplements, which can contain up to 50 times as much polyphenol as a single cup of tea.

Yang’s review cites experiments in which rodents and dogs died from liver poisoning when given very large doses of polyphenols. He also reports cases of people with liver toxicity

after overdosing on green-tea-based supplements. Their symptoms disappeared when they stopped taking the pills, only to return when they started taking them again (*Chemical Research in Toxicology*, vol 20, p 583).