

# Polyphenol antioxidants inhibit iron absorption

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Health benefits from polyphenol antioxidants -- substances found in many fruits and vegetables -- may come at a cost to some people. Penn State nutritional scientists found that eating certain polyphenols decreased the amount of iron the body absorbs, which can increase the risk of developing an iron deficiency.

"Polyphenols have been known to have many beneficial effects for human health, such as preventing or delaying certain types of cancer, enhancing [bone metabolism](#) and improving [bone mineral density](#), and decreasing risk of heart disease," said Okhee Han, assistant professor of nutritional sciences. "But so far, not many people have thought about whether or not polyphenols affect nutrient absorption."

The researchers, led by Han, studied the effects of eating grape seed extract and epigallocatechin-3-gallate (EGCG) found in [green tea](#). They used cells from the intestine — where iron absorption takes place — to assess the polyphenols' effect and found that polyphenols bind to iron in the intestinal cells, forming a non-transportable complex. This iron-polyphenol complex cannot enter the blood stream. Instead, it is excreted in the feces when cells are sloughed off and replaced.

Iron is necessary to carry oxygen from the lungs throughout the body and for other cellular functions. People already at risk for [iron deficiency](#) increase that risk if they consume high amounts of grape seed extract or EGCG.

"Iron deficiency is the most prevalent nutrient deficiency in the world, especially in developing countries where meats are not plentiful," said Han. "People at high risk of developing iron deficiency — such as pregnant women and young children — should be aware of what polyphenols they are consuming."

Han and her colleagues looked at the heme form of iron found in meats, poultry, and fish. Last year, they performed similar research with non-heme iron found in plants. They published the results of their study on grape seed extract and EGCG in the [Journal of Nutrition](#), showing that eating polyphenols decreased iron absorption.

Both grape seed extract and EGCG are sold in extract form. The results of these studies suggest that consumers should be cautious if using these products.

Han and her colleagues recently received a grant from the National Institutes of Health, National Center for Complementary and Alternative Medicine to expand this research. They will conduct animal studies and eventually hope to do human studies as well. Other authors on the paper include Qianyi Ma, graduate student in nutritional sciences, and Eun-Young Kim, research assistant in nutritional sciences.

Provided by Pennsylvania State University

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