

# Chemists create healthier pizza by boosting antioxidants in dough

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In an effort to improve health, many popular foods are undergoing a more nutritious make-over. Now, a team of food chemists at the University of Maryland has discovered how to boost the antioxidant content of pizza dough by optimizing baking and fermentation methods, a finding that could lead to healthier pizza, they say.

Pizza bakers have known for some time that longer-baking times and higher temperatures can enhance the flavor of pizza. The new study shows that these intense baking conditions also may boost antioxidant levels in dough, especially whole wheat varieties, the researchers say. Their findings were presented today at the 233rd national meeting of the American Chemical Society.

That's good news for fans of deep-dish, Chicago-style pizza, whose longer baking time and thicker crust "may have the potential to deliver higher levels of antioxidants in comparison to other pizza styles," says study co-author Jeffrey Moore, a doctoral student in food chemistry at the University of Maryland, College Park. Diets rich in antioxidants are thought to reduce the risk of cancer and heart disease.

"We chose to investigate pizza dough because it's one of the most popular wheat-based food products in the U.S.," says Moore. "Making popular food more healthy using the tools of chemistry may have a larger impact on public health."

The study is part of an ongoing effort by researchers at the university to

discover and develop new technologies that enhance the levels of natural antioxidants in grain-based food ingredients such as whole wheat flour. That effort is lead by Liangli Lucy Yu, Ph.D., an associate professor of food chemistry at the school and Moore's graduate advisor.

To demonstrate the effect of different baking conditions on the antioxidant levels in pizza dough, Moore exposed whole grain pizza dough from two different varieties of wheat to different baking temperatures, from 400 to 550 degrees Fahrenheit, and to different baking times, from 7 to 14 minutes. A number of tests were used to measure changes in antioxidant properties.

Longer baking times or higher temperatures generally corresponded to higher levels of antioxidants in comparison to less intense baking conditions, Moore found. Antioxidant levels increased by as much as 60 percent during longer baking times and by as much as 82 percent during higher baking temperatures, depending on the type of wheat flour and the antioxidant test used, the researcher says. The exact mechanisms involved are not yet fully understood, he says.

Both baking time and temperature can be increased together at the same without burning the pizza, according to Moore, if the process is monitored carefully.

As pizza dough is often allowed to ferment before baking, Moore tested the effect of different fermentation times, ranging from zero to 48 hours, on antioxidant properties. Longer fermentation times also boosted antioxidant levels, in some cases by as much as 100 percent, he says. The increase likely resulted from chemical reactions induced by yeasts, which had more time to release the antioxidant components that were bound in the dough, Moore says.

Although only whole wheat pizza was used in this study, it is possible

that these same cooking factors — longer baking time, higher temperature and longer fermentation — also will have an antioxidant boosting effect on refined pizza dough, but the effect will likely be less obvious, Moore says. That's because most of the antioxidants in wheat are found in the bran and endosperm components, which have been largely removed in refined flour, he says.

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Source: American Chemical Society

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