

# Roasting coffee beans a dark brown produces valued antioxidants: food scientists

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Food scientists at the University of British Columbia have been able to pinpoint more of the complex chemistry behind coffee's much touted antioxidant benefits, tracing valuable compounds to the roasting process.

Lead author Yazheng Liu and co-author Prof. David Kitts found that the prevailing antioxidants present in dark roasted coffee brew extracts result from the green beans being browned under high temperatures.

Their findings will appear in a forthcoming issue of [Food Research International](#) and can be previewed at:  
<http://dx.doi.org/10.1016/j.foodres.2010.12.037>.

Liu and Kitts analyzed the complex mixture of [chemical compounds](#) produced during the bean's browning process, called the "Maillard reaction." The term refers to the work by French chemist Louis-Camille Maillard who in the 1900s looked at how heat affects the carbohydrates, sugars and proteins in food, such as when grilling steaks or toasting bread.

Antioxidants aid in removing [free radicals](#), the end products of metabolism which have been linked to the aging process.

"Previous studies suggested that antioxidants in coffee could be traced to caffeine or the chlorogenic acid found in green coffee beans, but our results clearly show that the Maillard reaction is the main source of antioxidants," says Liu, an MSc student in the Faculty of Land and Food

Systems (LFS).

"We found, for example, that coffee beans lose 90 per cent of their chlorogenic acid during the roasting process," says Kitts, LFS food science professor and director of the Food, Nutrition and Health program.

The UBC study sheds light on an area of research that has yielded largely inconsistent findings. While some scientists report increased antioxidant activity in coffee made from dark roasted beans, others found a decrease. Yet other theories insist that medium roast coffees yield the highest level of antioxidant activity.

"We have yet to fully decipher all the complex compounds in roasted [coffee beans](#). We only know the tip of the iceberg," says Kitts, who has been studying Maillard reaction chemicals over the past 25 years.

Provided by University of British Columbia

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