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Ingredient of dark roasted coffees may make them easier on the tummy

Roasting produces compound that appears to reduce acid production

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SAN FRANCISCO – Roasting coffee beans doesn't just impart bold, rich flavor. It also creates a compound that helps dial down production of stomach acid, according to research presented on March 21 at the spring meeting of the American Chemical Society. The discovery may explain why dark roasted brews are gentler on the stomach than their lighter peers, and could lead to a new generation of tummy-friendly coffees.

Even though several studies have found a cup-a-day habit imparts health benefits such as decreased risk of obesity, Alzheimer's and colon cancer, many coffee lovers drink decaf or forgo the beverage altogether because it irritates the stomach or spurs heartburn. Previous work suggested that coffee made from steam-treated beans tamps down this gastric distress, a finding attributed to lower levels of caffeine and other compounds in these brews.

"But there is no experimental or human data that says these compounds increase gastric acid," said Veronika Somoza of the University of Vienna, who presented the research.

To explore the science behind these gentler brews, Somoza and her colleagues used water and three other solvents to extract compounds from regular commercial coffee blends. Each solvent extracted a different profile of compounds, including caffeine and N-methylpyridinium, a ringed compound that doesn't appear in green coffee beans but is created in the roasting process. Stomach cells exposed to each suite of compounds upped their acid secretion, except for the cells exposed to the extract containing NMP.

The team then compared the chemical profiles of a dark roasted and light roasted brew made with regular roasted and steam-treated beans. Both versions of the dark roasted coffee had more than 30 milligrams per liter of NMP, as compared with the lighter roast, which had 22 mg/l. The light roast that was subjected to steam treatment, a technique thought to weaken coffee's stomach-provoking powers, had a mere 5 mg/l of NMP.

Follow-up work confirmed the molecule's mild-mannered nature. Human stomach cells treated with coffee that had medium or high concentrations of NMP secreted far less acid than cells treated with coffee containing the least amount of NMP, Somoza reported. And

the activity of many of the genes and proteins involved in this gastric secretion were quashed in cells exposed to NMP-rich coffee. The research team is now conducting a pilot study in which subjects swallow a sensor embedded in a capsule that measures the stomach's pH and transmits the readings to a computer. Preliminary results suggest that stomach acid surges for a longer time when subjects drink light roast coffee compared to dark roast.

"Most people think that non-processed food is beneficial, that possibly raw foods are best, but we do not believe that," Somoza said. "There are healthy, beneficial compounds in processed food. Our idea is to identify these beneficial compounds and enhance them."

How NMP acts on the gastric system isn't well understood. Acid secretion didn't change noticeably in stomach cells treated with NMP alone. And caffeine's name hasn't been cleared — the friendlier darker brews also had less caffeine than their lighter-brewed counterparts.

This lower caffeine may also contribute to the darker roasts' antacid powers. While chemists are fond of breaking bigger things into their smaller parts, these parts often work in concert, said Bhimu Patil of Texas A&M University in College Station. "It's important to break things down to understand them, but most of the time there is a synergistic effect."

CITATIONS & REFERENCES :

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