

Cocoa or green tea could protect you from the negative effects of fatty foods during mental stress – study

UNIVERSITY OF BIRMINGHAM
NEWS RELEASE 18-NOV-2024

University of Birmingham News Release

New research has found that a flavanol-rich cocoa drink can protect the body's vasculature against stress even after eating high-fat food.

Food choices made during periods of stress can influence the effect of stress on cardiovascular health. For example, recent research from the University of Birmingham found that high-fat foods can negatively affect vascular function and oxygen delivery to the brain, meanwhile flavanol compounds found in abundance in cocoa and green tea can protect vascular function during periods of everyday stress.

Now, in a new study, the same research team has found that drinking cocoa high in flavanols in combination with a fatty meal can counteract some of the impact of fatty food and protect the vascular system from stress.

The research has been published today (18th November) in the journal *Food and Function*.

Dr Catarina Rendeiro, Assistant Professor in Nutritional Sciences at the University of Birmingham, and leading author said: "We know that when people are stressed, they tend to gravitate towards high-fat foods. We have previously shown that fatty food can impair the body's vascular recovery from stress. In this study, we wanted to see if adding a high-flavanol food to the fatty meal would alleviate the negative impact of stress in the body"

Rosalind Baynham, first author on the paper, explained: "Flavanols are a type of compound that occur in different fruits, vegetables, tea and nuts including berries and unprocessed cocoa. Flavanols are known to have health benefits, particularly for regulating blood pressure and protecting cardiovascular health.

"We took a group of young healthy adults and gave them two butter croissants with 10 g salted butter, 1.5 slices of cheddar cheese and 250 ml whole milk as breakfast, and either a high-flavanol cocoa or a low-flavanol cocoa drink. Following a rest period, we asked the participants to complete a mental maths test which increased in speed for eight minutes, alerting them when they got an answer wrong. During the 8 minute rest period and 8 minute mental maths test, we measured forearm blood flow, cardiovascular activity and prefrontal cortex (PFC) tissue

oxygenation. We also measured vascular function using Brachial Flow-mediated dilatation (FMD), which is a prognostic measure for future risk of cardiovascular disease. This stress task induced significant increases in heart rate and blood pressure, similar to the stress you may encounter in daily life.”

The cocoa beverages were prepared by dissolving 12 g cocoa powder into 250 ml of whole milk. The low-flavanol powder was an alkalized cocoa powder which was processed to reduce total flavanols to 5.6 mg per serving; and the high-flavanol cocoa powder was a non-alkalized powder, delivering 695.0 mg total flavanols per serving. Alkalization is a process typically used in chocolate making to enhance flavour, but unfortunately it reduces the amount of flavanols.

The team confirmed that consuming fatty foods with the low-flavanol drink when mentally stressed reduced vascular function (by 1.29% FMD) and lasted up to 90 minutes after the stressful event was over. The findings also showed that the cocoa drink high in flavanols was effective at preventing the decline in vascular function following stress and fat consumption. Brachial flow-mediated dilatation was significantly higher following high-flavanol cocoa compared to low-flavanol cocoa 30 and 90 minutes after the stressful period. The team had also found in their previous work, that eating high-fat foods attenuated cerebral oxygenation in the pre-frontal cortex, during stress. However, cocoa flavanols did not improve cerebral oxygenation or impact mood.

Dr Catarina Rendeiro, Assistant Professor in Nutritional Sciences at the University of Birmingham, added: “This research shows that drinking or eating a food high in flavanols can be used as a strategy to mitigate some of the impact of poorer food choices on the vascular system. This can help us make more informed decisions about what we eat and drink during stressful periods.”

In the supermarket look for a minimally processed cocoa powder, and if cocoa isn’t quite your beverage of choice, there are other ways you can get a higher dose of flavanols, such as green tea, black tea and berries. Recent published guidelines for flavanol intake recommend between 400 to 600 mg/day, which can be achieved for example, by consuming two cups of black or green tea, or a combination of berries, apples and high-quality cocoa.

Jet Veldhuijzen van Zanten, Professor of Biological Psychology at the University of Birmingham, and author of this paper added: “Modern life is stressful and the impact of stress on our health and the economy has been well documented, so any changes we can make to protect ourselves from some of the symptoms of stress is positive. For those who tend to reach for a treat when stressed or depend on convenient food because they work high-pressure jobs or are time-poor, incorporating some of these small changes could make a real difference.”