

Scientific News

Dark Chocolate May Improve the Metabolic Response to Stress, Nestlé Scientists report

Lausanne, SWITZERLAND 11 November 2009 – Anxiety and stress can have considerable effects on human health, causing a variety of physical and emotional conditions, and sometimes leading to more serious health concerns. Scientists at the Nestlé Research Center in Lausanne, Switzerland, found that beneficial constituents in dark chocolate may improve the metabolic state of people that report feeling higher levels of stress. The full article is available in the [Journal of Proteome Research](#).

In the present study, 30 healthy adults consumed two portions of 20g daily of dark chocolate for fourteen consecutive days. Scientists at the Nestlé Research Center measured the subjects' global metabolic responses attributed to daily dark chocolate consumption, with particular emphasis on stress-related metabolic changes such as energy metabolism and gut microbial activities. They additionally assessed participants' anxiety characteristics using validated questionnaires.

Results indicated that for individuals that reported feeling higher levels of stress, daily dark chocolate consumption had a positive impact on stress-associated metabolic activities. These findings suggest beneficial attributes of consuming dark chocolate to improve the metabolic reaction to stress.

Lifestyle and genetic factors, including diet, substantially influence individuals' metabolic responses. A previous study by Nestlé scientists revealed that dietary preferences, including chocolate consumption, can significantly impact energy and microbiota metabolism. Scientists at the Nestlé Research Center continue to strengthen their position that the gut ecology and metabolic activity of healthy individuals may be modulated by the diet.

“Consuming dark chocolate daily can positively impact the metabolism of people that report having high-stress levels,” says Sunil Kochhar, Nestlé researcher leading the study. “These results strongly support our ongoing metabonomics research efforts to ascertain the impact of certain foods on human metabolism through the adaptation of gut microbial activities.”

Article Reference:

Martin FJ, Rezzi S, Peré-Trepas E, Kamlage B, Collino S, Leibold E, Kastler J, Rein D, Fay LB and Kochhar S. Metabolic effects of dark chocolate consumption on energy, gut microbiota and stress-related metabolism in free-living subjects. *Journal of Proteome Research*, 2009; Published online ahead of print, Oct 2009.

Related Articles:

Rezzi S, Ramadan Z, Martin FJ, Fay LB, van Bladeren P, Lindon JC, Nicholson JK, Kochhar S. Human Metabolic Phenotypes Link Directly to Specific Dietary Preferences in Healthy Individuals. *Journal of Proteome Research*, 2007;6:4469-77.

Martin FJ, Wang Y, Sprenger N, Yap K, et al. Probiotic modulation of symbiotic gut microbial-host metabolic interactions in a humanized microbiome mouse model. *Molecular Systems Biology*, 2008;4(157):1-15.



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Rezzi S, Ramadan Z, Fay LB, Kochhar S. Nutritional Metabonomics: Applications and Perspectives. *Journal of Proteome Research*, 2007;6:513-25.

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