



Good Food, Good Life

Chocolate's Metabolic Signature Discovered by Nestlé Scientists

Lausanne, SWITZERLAND 15 October 2007 - Researchers from the Nestlé Research Center, Lausanne, Switzerland, published a study in the online October edition (anticipated November print) of the *Journal of Proteome Research* investigating the link between metabolic phenotypes and the dietary preference for eating chocolate. The full contribution is available at the [Journal of Proteome Research web site](#).

Nestlé scientists developed a new methodology called “nutrimetabonomics” to make associations between individual metabolic phenotypes and nutritional preferences. In the current study, 22 healthy men were identified as either “chocolate desiring” or “chocolate indifferent” based on a chocolate preference questionnaire. In a double-blind cross-over study design, subjects followed a one week standard diet including chocolate and a placebo. Samples of blood and urine were collected for metabolic analysis. Specific post-prandial lipoprotein profiles and gut microflora biomarkers in subjects revealed a metabolic signature for the “chocolate desiring” group.

The metabolites of “chocolate desiring” subjects compared to those that were “chocolate indifferent” were distinctly different. The chocolate-preferring group had decreased LDL cholesterol levels and a moderately higher level of albumin compared to the chocolate indifferent group. Interestingly, even in the absence of chocolate stimulation, the chocolate-preferring subjects still showed intrinsically different lipoprotein and lipid status.

Urinary profiles of the two subject groups showed that energy and microbiota metabolism varied between the dietary preference groups. The scientists conclude that the ecology and metabolic activity of the gut in healthy individuals may be modulated by the diet more than previously thought. *“We know that human gut microbes vary significantly between individuals, resulting in important health consequences, but we did not realise that subtle differences in dietary preferences may lead to metabolic imprinting involving gut microbial metabolism,”* said Professor Jeremy Nicholson, Imperial College London.

“These results open new avenues to assess diet and its metabolic consequences, providing a way forward into personalized nutrition programs,” said Dr Sunil Kochhar, Nestlé Research Center scientist leading the study.

The metabolic imprinting findings provide evidence for a link between specific dietary preferences and metabolic phenotypes. This link between dietary preference and metabolite can be further extrapolated to develop functional foods to meet the nutritional needs of individuals with specific metabolic phenotypes.

Article Reference:

Rezzi S, Ramadan Z, Martin FP, Fay L, van Bladeren P, Lindon J, Nicholson K, Kochhar S. Human Metabolic Phenotypes Link Directly to Specific Preferences in Healthy Individuals. *Journal of Proteome Research* 2007.

About the Nestlé Research Center

Established in 1987, the Nestlé Research Center (NRC), Lausanne, Switzerland, is one of the world's leading research institutions in food, nutrition and life sciences. With a diverse staff of leading researchers from a broad range of scientific competencies, NRC possesses a unique blend of talent





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and expertise. Knowledge on nutrition and health, food science, food/consumer interaction and food quality and safety are combined at the Nestlé Research Center to help develop Good Food as a source of Good Health throughout life. Learn more about the Nestlé Research Center at www.research.nestle.com.

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