

8th Euro Global

Diabetes Summit and Medicare Expo

November 03-05, 2015 Valencia, Spain

Dietary-induced health benefits beyond sugar replacement in people with type-2 diabetes

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Excessive intake of added sugars has been associated with health issues including diabetes. This has encouraged food scientists to reduce sugar in foods without compromising taste using calorie-reduced bulk sweeteners such as polyols. The newest polyol is erythritol (ERT), a white, crystalline powder with similar crystal appearance, density, and sweetness quality as sugar (sucrose). It is non-caloric, non-glycemic, non-insulinemic and non-cariogenic. Emerging evidence shows that ERT has health potential that goes beyond the mere replacement of sugar, especially in people with type-2 diabetes. Diabetes is characterized by hyperglycemia and development of vascular pathology. Endothelial cell (EC) dysfunction (ECD) is a starting point for pathogenesis of vascular complications in diabetes. We previously showed ERT to be a hydroxyl radical scavenger preventing ECD onset in diabetic rats. To better understand how ERT mediates this protective effect, ERT was studied in EC (HUVECs) exposed to diabetic stressors. Decreased viability of EC and increased oxidative damage resulting from such exposure were attenuated in the presence of ERT. Protective effects of ERT during hyperglycemia were confirmed and mechanistically expanded upon, with transcriptomics. A human pilot study in 24 subjects with type-2 diabetes consuming 36 g ERT daily as a lemon-flavored beverage for 28 days showed that acute consumption significantly improved microvascular endothelial function and chronic consumption reduced central pulse pressure and carotid-femoral pulse-wave velocity, both indicating favorable effects on aortic compliance. Chronic ERT consumption also reduced systolic blood pressure in 12 subjects with a blood pressure above the recommended goal of 130 mm Hg while no change was observed in normotensive subjects.

Biography

Peter Decock graduated as Food Technologist in 1979 at HAS University of Applied Sciences. He started as R&D Project Leader at General Mills and in 1985 became R&D Manager at OZF responsible for confectionary, fine bakery, chocolate and ice cream. In 1989, he moved to Gist-brocades (now DSM) as European Technology Manager to lead the development of new pastry and bread ingredients and monitor corporate R&D projects. He joined Cargill in 1992 as Deputy Manager of the European Food Application Centre. From 1995, he directed more than 10 years a multidisciplinary team to successfully launch erythritol on the global market. Since 2006, he leads Global Nutrition and Regulatory Affairs. The research he currently directs targets dietary and personal care solutions for improved oral and cardiovascular health.

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