Polyphenol-rich juice passes bioavailability test: Coca-Cola

By Stephen Daniells, 08-Jun-2010

Polyphenols can be absorbed into the blood stream when consumed from a beverage, showing the potential to deliver the antioxidants via a juice, says a new study from Coca-Cola.

Compounds from a range of sources, including green tea, apples, grapes, and citrus were absorbed in both the small and large intestine when consumed by human volunteers, according to findings published in Molecular Nutrition & Food Research.

Interestingly, there was no evidence of any major interactions between the various polyphenols, said the researchers, showing that the results are "transferable to other specific combinations in beverages, allowing us to conclude that polyphenol-rich drinks may, in principle, be explored as a convenient vehicle to deliver a blend of potentially protective polyphenols and flavonoids into the diet without major changes in eating habits", wrote the researchers.

Rising to the challenge

Polyphenols are receiving extensive research due to their potent antioxidant activity, their ability to mop-up harmful free radicals, and the associated health benefits. Many have also been implicated in possible protection against diseases such as cancer and cardiovascular disease, while some have been reported to potentially offer protection from Alzheimer’s.

Despite this interest, Ming Hu from the University of Houston recently issued "a call to arms" for more relevant research into the bioavailability and utilisation of the antioxidants, particularly polyphenols, in order to help "the successful development of polyphenols as chemopreventive agents in the future" (Molecular Pharmaceutics, Vol. 4, pp. 805-806).

The new study, a collaboration between Coca-Cola and the University of Glasgow in Scotland, works towards the successful development of polyphenol-rich products to boost human health.

Study details

Led by Glasgow’s Alan Crozier, the researchers used a range of ingredients to enable preparation of a low-calorie, 28 per cent beverage. The juice contained green tea flavan-3-ols, citrus flavanones, grape seed and pomace procyanidins, procyanidins and chlorogenic acid, apple dihydrochalcones, and grape anthocyanins.

Ten human volunteers were recruited and asked to consume a diet low in flavonoids for 2 days prior to drinking a 350 mL portion of the polyphenol-rich beverage. The researchers found no differences in the levels of urinary metabolites when subjects consumed the polyphenol-rich juice compared with data from other studies where subjects consumed green tea, orange juice, apple cider or coffee.

"This indicates that the combination of polyphenolic compounds in the P-R beverage are absorbed and excreted to a similar extent whether fed individually or together in a single beverage," stated the researchers.

Dr Crozier and his team also note that absorption of the compounds was split between the small and large intestine, indicating that "metabolites may be circulating in the body for a more sustained period of time than would occur after ingestion of a beverage containing a more restricted spectrum of polyphenolic components".

It is concluded that the P-R beverage can deliver the intended blend of bioavailable polyphenols, which would normally require consumption of several different plant-derived foods.

The study was funded by the Coca-Cola Company.

The subject of polyphenols and bioavailability will be discussed at the upcoming NutraIngredients Antioxidants 2010 conference on June 30th in Brussels. For more information and to register, please click here. www.ni-antioxidants.com

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"Bioavailability of multiple components following acute ingestion of a polyphenol-rich juice drink"
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