

Influence of dietary lipids on bioaccessibility and bioavailability of carotenoids

Chandrika Udumalagala Gamage

University of Sri Jayewardenepura, Sri Lanka

Carotenoids are lipid-soluble pigments found in many fruits and vegetables. Apart from their well-known vitamin A activity, these process antioxidant, anticancer, immune enhancement and anti-obesity activities related to prevention of degenerative diseases.

The intestinal absorption of carotenoids occurs primarily in the small intestine, in several steps including: (1) release from the food matrix; (2) incorporation into bile-salt mixed micelles; (3) uptake by intestinal mucosal cells; and (4) incorporation into chylomicrons. Absorption of dietary carotenoids is affected by several factors. Dietary lipid is a positive promoter of carotenoids absorption in vivo. The objective of this lecture is to discuss current knowledge of the impact of dietary lipids on carotenoid bioaccessibility and bioavailability in humans

There are reports that consumption of cooked vegetables containing oil resulted in a significant increase in serum retinol concentrations in human. In support of these findings, in vitro studies carried out by our group showed that, in traditional methods of cooking in Sri Lanka where coconut milk is added to the vegetables, the proportion in vitro availability of all-trans- beta-carotene is much higher than in the same vegetables cooked with water.

It is also recognized that co-consumption of lipid in the form of triacylglycerol is one of the most effective stimulators of carotenoid absorption in vivo. MUFA rich lipids promote greater carotenoid absorption than PUFA rich lipids, especially for the more polar carotenoids. Research has shown that the impact of SFA on carotenoid absorption is complex. It is also suggested that beta-carotene may have lower solubility in micelles composed of MCT than LCT, leading to lower intestinal absorption.

Future in vitro and in vivo investigations should be focused on not only the effect of dietary lipids but also interactions between dietary lipids and other factors on bioavailability of carotenoids

keywords: dietary lipids, bioavailability, carotenoids