Title: Potential Role of D-Limonene in Breast Cancer Prevention

Iman A. Hakim, Jessica A. Miller, Cynthia A. Thomson, and H-H. Sherry Chow
University of Arizona Health Sciences Center, Tucson 85724, USA

Limonene is a bioactive food component found in high concentration in citrus peel oil. It has shown chemopreventive and chemotherapeutic activities in preclinical studies of mammary carcinogenesis. As a fat-soluble compound, d-limonene is more likely to deposit in fatty tissues such as the breast. In our previous work, we have found that lemonade prepared with the whole lemon (Mediterranean-style lemonade) contains high levels of d-limonene. To assess the bioavailability and disposition of d-limonene in humans, we conducted a pilot feeding study with d-limonene-rich lemonade. Healthy adults consumed 40 oz. of freshly prepared lemonade containing 500 to 600 mg d-limonene daily for 4 weeks. On the first and last consumption days, blood and buttock fat biopsy were collected. Matched plasma and fat biopsies were analyzed for d-limonene levels using gas chromatography and mass spectrometry. Our data showed that d-limonene and its major metabolite are bioavailable after oral consumption of a citrus preparation rich in d-limonene content. There was a significant increase in plasma and adipose d-limonene levels at the end of four weeks. However, adipose d-limonene levels were significantly higher than plasma levels ($P = 0.009$). Our results confirmed the accumulation of d-limonene in adipose tissue after oral dosing in humans and support additional studies of d-limonene for chemoprevention in tissues such as the breast that are comprised of a significant fat fraction.

Biography

Dean Iman Hakim is a professor of public health and the Dean of the University of Arizona College of Public Health. She is internationally known for her translational research on the role of bioactive food compounds in modulation of oxidative damage and prevention of chronic diseases. She has been the Principal Investigator of several large-scale clinical trials focused on nutrition and cancer prevention. Dr. Hakim earned her medical degree from Cairo University in Egypt and her PhD from Ain-Shams University in Cairo, Egypt. She received her MPH degree in Preventive Medicine from the University of Arizona, College of Medicine.

Presenting author details

Full name: Iman A. Hakim
Contact number: 520-626-5355
Session name/number: Nutrition and Cancer Prevention /
Category: Oral Presentation