

Article

Micronutrient Status in Female University Students: Iron, Zinc, Copper, Selenium, Vitamin B₁₂ and Folate

Flavia Fayet-Moore ¹, Peter Petocz ² and Samir Samman ^{1,*}

¹ Discipline of Nutrition & Metabolism, School of Molecular Bioscience, The University of Sydney, NSW 2006, Australia; E-Mail: flavia@nraus.com

² Department of Statistics, Macquarie University, Ryde, NSW 2112, Australia; E-Mail: peter.petocz@mq.edu.au

* Author to whom correspondence should be addressed; E-Mail: samir.samman@sydney.edu.au; Tel.: +61-2-9351-2476.

Received: 17 August 2014; in revised form: 24 October 2014 / Accepted: 28 October 2014 /

Published: 13 November 2014

Abstract: Young women are at an increased risk of micronutrient deficiencies, particularly due to higher micronutrient requirements during childbearing years and multiple food group avoidances. The objective of this study was to investigate biomarkers of particular micronutrients in apparently healthy young women. Female students ($n = 308$; age range 18–35 year; Body Mass Index 21.5 ± 2.8 kg/m²; mean \pm SD) were recruited to participate in a cross-sectional study. Blood samples were obtained from participants in the fasted state and analysed for biomarkers of iron status, vitamin B₁₂, folate, homocysteine, selenium, zinc, and copper. The results show iron deficiency anaemia, unspecified anaemia, and hypoferritinemia in 3%, 7% and 33.9% of participants, respectively. Low vitamin B₁₂ concentrations (<120 pmol/L) were found in 11.3% of participants, while 4.7% showed sub-clinical deficiency based on serum methylmalonic acid concentrations >0.34 μ mol/L. Folate concentrations below the reference range were observed in 1.7% (serum) or 1% (erythrocytes) of participants, and 99.7% of the participant had erythrocyte-folate concentrations >300 nmol/L. Serum zinc concentrations <10.7 μ mol/L were observed in 2% of participants. Serum copper and selenium concentrations were below the reference range in 23% and 11% of participants, respectively. Micronutrient deficiencies including iron and vitamin B₁₂, and apparent excess of folate are present in educated Australian female students of childbearing age, including those studying nutrition. The effects of dietary behaviours and food choices on markers of micronutrient status require further investigation.