

Folic acid, riboflavin, thiamin and vitamin B6 status of a group of first-time blood donors*CK Booth*

Defence Nutrition Research Centre, 76 George St, Scottsdale, TAS, 7260

A recent inquiry by the Australia New Zealand Food Authority into vitamins and minerals highlighted the lack of Australian dietary and nutritional status data (1). The present work helps address this deficit by detailing analytical methods and normal reference intervals for folic acid, thiamin, riboflavin and vitamin B6 status in healthy adults.

First-time blood donors ($n = 1\,776$, 52% = females, mean age = 31.5 yr) attending the Brisbane Queen Street Centre of the Red Cross Blood Transfusion Service during 1995 were assessed for B-group vitamin status. A smaller group ($n = 111$, 52% = females, mean age = 39.2 yr) was selected from staff and students of the Royal Brisbane Hospital for determination of normal reference intervals. Those accepted for inclusion in the reference-interval group had no adverse medical history, had an acceptable weight for height and met at least 70% of the Recommended Dietary Intake of nutrients. They were non-smokers and took neither nutritional supplements nor medications within two weeks of blood donation. Furthermore, they were social drinkers only, and did not take alcohol within 48 hours of blood donation. All reference-interval subjects had normal biochemistry (iron studies, lipid profile, electrolytes and liver-function tests). The only information collected in the survey of first-time blood donors, apart from B-group vitamin status, was age and gender.

Red blood cell concentrations of thiamin and folic acid were measured by microbiological methods. Vitamin B6 and riboflavin status were measured by erythrocyte aspartate transaminase activity coefficient and erythrocyte glutathione reductase activity coefficient, respectively.

One in four first-time blood donors ($n = 474$, 27%) was found to be vitamin deficient. Significant numbers of the donors were folic acid ($n = 97$, 6.8%), thiamin ($n = 176$, 13%) and riboflavin ($n = 168$, 10%) deficient. Prevalence of vitamin B6 deficiency ($n = 89$, 5.4%) was not significant. In the case of folic acid, significantly more females (6.7% of females) than males (4.1% of males) were considered deficient ($\chi^2 = 3.883$, $P = 0.049$). Few donors ($n = 56$, 3%) were deficient in more than one vitamin and only one subject was found deficient in 3 vitamins. No donors were deficient in 4 vitamins. There were no significant differences in the age breakdown of the deficient groups when compared with the larger survey group.

The results indicated that the prevalence of specific vitamin deficiencies among apparently healthy Australian adults may be greater than suggested by national dietary intake data. These results coupled with the lack of Australian food composition data for folic acid and vitamin B6 reinforce the need for monitoring nutritional status by both dietary and biochemical means.

1. National Food Authority, Inquiry into vitamins and minerals. Canberra: Auscript, 1992. [Vitmin 4.11.92.]