

## Folate, vitamin B12, and vitamin B6 status of a group of high socioeconomic status women in the Alberta Pregnancy Outcomes and Nutrition (APrON) cohort

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### Abstract

Folic acid supplementation and food fortification policies have improved folate status in North American women of child bearing age. Recent studies have reported the possible inadequacy of vitamin B12 and B6 in the etiology of neural tube defects in folate-fortified populations. The aims of this study were to describe folate status and its relationship to supplementation and to assess vitamin B12 and B6 status in a cohort of pregnant women. Supplement intake data were collected in each trimester from the first cohort ( $n = 599$ ) of the Alberta Pregnancy Outcomes and Nutrition (APrON) study. Red blood cell folate (RBCF) and plasma folate, holotranscobalamin, and pyridoxal 5-phosphate were measured. Overt folate deficiency was rare (3%) but 24% of women in their first trimester had

suboptimal RBCF concentration ( $<906$  nmol  $\cdot$  L $^{-1}$ ). The proportion of the cohort in this category declined substantially in second (9%) and third (7%) trimesters. High RBCF ( $>1360$  nmol  $\cdot$  L $^{-1}$ ) was observed in approximately half of the women during each pregnancy trimester. Vitamin B12 and B6 deficiencies were rare ( $<1\%$  of the cohort). Women consuming folic acid supplements above the upper level had significantly higher RBCF and plasma folate concentrations. In conclusion, the prevalence of vitamin B12 and B6 deficiency was very low. A quarter of the women had suboptimal folate status in the first trimester of pregnancy and over half the women had abnormally high RBCF, suggesting that supplementation during pregnancy is not appropriate in a cohort of women considered to be healthy and a low risk for nutritional deficiencies.

**Key words:** folic acid, holotranscobalamin, pyridoxal 5-phosphate, neural tube defects, supplementation.