

## Efficacy of flour fortification with folic acid in women of childbearing age in Iran

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(2011) *Annals of Nutrition and Metabolism*, 58 (3), pp. 188-196. Cited 8 times.

DOI: 10.1159/000329726

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### Abstract

Background: Flour fortification with folic acid is one of the main strategies for improving folate status in women of childbearing age. No interventional trial on the efficacy of folic acid fortification has been conducted so far in Iran. Objectives: To study the effects of flour fortification with folic acid on any reduction in neural tube defects (NTDs) and folate status of women of childbearing age. Methods: In a longitudinal hospital-based study, 13,361 postpartum women were studied after admission for childbirth before and after fortification. In addition, two cross-sectional surveys were conducted before (2006) and after flour fortification (2008). The cluster sampling method was used and 580 women, 15-49 years old, were studied as a representative sample of Golestan province in the north of Iran. Fasting blood samples were collected to measure serum vitamin B 12, folate and plasma homocysteine. Sociodemographic data, health characteristics and dietary intake were determined. Results: The mean daily intakes of folate from natural food before and after flour fortification were 198.3 and 200.8 µg/day, respectively. The total folate intake increased significantly from 198.3 to 413.7 µg/day after fortification (p < 0.001). Folate intake increased by an average of 226 µg/day from fortified bread. The mean serum folate level increased from 13.6 to 18.1 nmol/l; folate deficiency decreased from 14.3 to 2.3% (p < 0.001). The incidence rate of NTDs declined by 31% (p < 0.01) in the post-fortification period (2.19 per 1,000 births; December 2007 to December 2008) compared to the pre-fortification period (3.16 per 1,000 births; September 2006 to July 2007). Conclusions: Implementation of mandatory flour fortification with folic acid can lead to a significant increase in serum folate and a significant decrease in NTDs. Copyright © 2011 S. Karger AG, Basel.

### Author Keywords

Flour fortification; Iran; Mandatory; Neural tube defects; Women, childbearing age

### Index Keywords

cyanocobalamin, folic acid, homocysteine; adolescent, adult, article, blood sampling, dietary intake, female, flour, folic acid deficiency, human, human experiment, incidence, Iran, longitudinal study, neural tube defect, normal human, nutritional status, priority journal, puerperium, vitamin blood level; Adolescent, Adult, Bread, Cross-Sectional Studies, Female, Flour, Folic Acid, Folic Acid Deficiency, Food, Fortified, Homocysteine, Humans, Iran, Longitudinal Studies, Middle Aged, Neural Tube Defects, Nutritional Status, Socioeconomic Factors, Vitamin B 12, Young Adult

### Chemicals/CAS

cyanocobalamin, 53570-76-6, 68-19-9, 8064-09-3; folic acid, 59-30-3, 6484-89-5; homocysteine, 454-28-4, 6027-13-0; Folic Acid, 59-30-3; Homocysteine, 454-28-4; Vitamin B 12, 68-19-9

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ISSN: 02506807

CODEN: ANUMD

PubMed ID: 21757892

Language of Original Document: English

Abbreviated Source Title: Ann. Nutr. Metab.

Document Type: Article

Source: Scopus