

# Folic Acid

**F**olic acid (also called **folate**) is one of the **B vitamins** (substances essential in very small quantities for nutrition). Leafy vegetables such as spinach and turnip greens, dried beans and peas, avocados, bananas, oranges, and asparagus provide us with natural sources for this vitamin. Folate is essential for the body. It is involved in the synthesis, repair, and normal functioning of **DNA (deoxyribonucleic acid)**—the molecular basis for heredity). Folate is necessary for the production and maintenance of new cells. This is especially important during periods of rapid cell division and growth that occurs during pregnancy and in the development of young children.

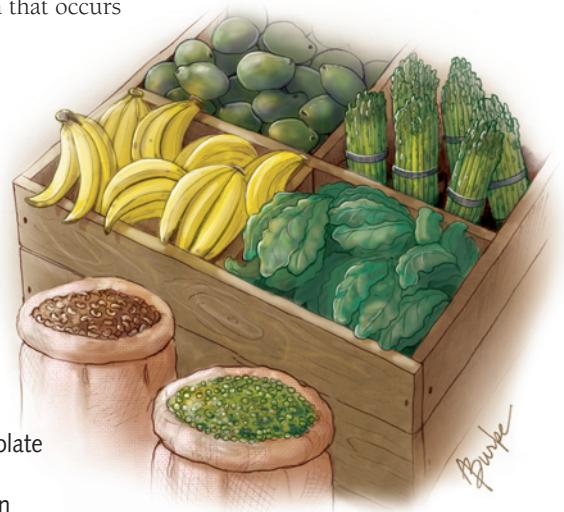
The December 13, 2006, issue of *JAMA* includes an article on folate supplementation and its effect on risk of cardiovascular diseases.

## BENEFITS OF FOLIC ACID

- **Prevention of Birth Defects**—In 1996, the FDA published regulations requiring the addition of folic acid to enriched breads, cereals, flours, and other grain products. This was specifically targeted to reduce the risk of **neural tube defects** (malformations of the spinal cord) in newborns. The Centers for Disease Control and Prevention reported in 2004 that since the addition of folic acid to grain-based foods, the rate of neural tube defects has dropped by 25% in the United States.
- **Prevention of Cancer**—Scientific evidence suggests that low blood levels of folate may result in damage to DNA and may lead to cancer. Long-term folic acid supplementation has been shown to be helpful in preventing breast and colon cancers.
- **Treatment of Noncancerous Diseases**—**Methotrexate** is a powerful drug used to treat a variety of diseases such as rheumatoid arthritis, lupus, psoriasis, asthma, sarcoidosis, and inflammatory bowel disease. It can deplete folate stores and cause side effects that are similar to folate deficiency. Both high-folate diets and supplemental folic acid may help to reduce toxic side effects of methotrexate without decreasing its effectiveness.
- **Prevention of Heart Disease**—Low blood concentrations of folate, vitamin B<sub>12</sub>, and vitamin B<sub>6</sub> may increase the level of **homocysteine**, an amino acid normally found in the blood. There is evidence that an elevated homocysteine level is an independent risk factor for heart disease and stroke. The effects of folic acid supplementation in lowering the risks of such heart and blood vessel disease are still being evaluated.

## ADVERSE EFFECTS

Although folic acid is generally accepted as safe, there are concerns that its use as a dietary supplement may have adverse effects in certain groups of individuals. Adverse effects are rare but may include fever, general weakness, shortness of breath, wheezing, tightness in the chest, rash, and itching. There is also a concern that high levels of folate in the blood can mask a vitamin B<sub>12</sub> deficiency, which can lead to nerve damage.



## FOR MORE INFORMATION

- National Institutes of Health  
[www.cc.nih.gov/cc/supplements](http://www.cc.nih.gov/cc/supplements)
- American Academy of Family Physicians  
[www.aafp.org](http://www.aafp.org)  
[search.familydoctor.org](http://search.familydoctor.org)

## INFORM YOURSELF

To find this and previous *JAMA* Patient pages, go to the Patient Page Index on *JAMA*'s Web site at [www.jama.com](http://www.jama.com). Many are available in English and Spanish. A Patient Page on vitamins A to K was published in the June 19, 2002, issue.

Sources: American Academy of Family Physicians, National Institutes of Health

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