

## Folate

### WHAT IS IT?

Folate is a water-soluble B vitamin that occurs naturally in food and is essential for health. Folic acid is the man-made form, which is found in vitamin supplements and is added to fortified foods.

### WHAT DOES IT DO?

Folate needs to be consumed as part of a healthful diet. In general, folate is necessary for healthy blood and is very important to women in reducing their risk of having a baby with a serious birth defect.

Folate's specific roles in the body include:

- is essential in making and maintaining new body cells.
- is needed to make DNA and RNA, the building blocks of cells.
- helps prevent changes to DNA that may lead to cancer.
- helps reduce the risk of delivering a baby with neural tube defects.
- combines with vitamin B<sub>12</sub> to form hemoglobin in red blood cells.
- helps to prevent anemia.
- may help protect against heart disease and stroke by maintaining normal levels of homocysteine\* in the blood.
- helps prevent depression.
- helps reduce risk of macular degeneration, a disease of the eyes that leads to blindness.

*\*Homocysteine is the amino acid that is emerging as a new risk factor for atherosclerosis and the heart attacks and strokes that result.*

### SOURCES

Eat a healthy diet that contains lots of fruits and vegetables and other foods that have folic acid (or folate) in them or added to them. Foods that are natural sources of folate include: oranges and orange juice from concentrate; cooked dry beans and peas; deep green leaves like spinach and

mustard greens; broccoli; asparagus; peanuts; almonds; and avocados.

In 1998 the United States began a folic acid fortification program, requiring that folic acid be added to many common grain and cereal products: enriched flours; breads; pastas; crackers; corn grits; cornmeal; rice; macaroni; some breakfast and ready-to-eat-cereals; and other grain products. This has helped to increase consumption of folic acid. Fortified ready-to-eat-cereals, or cold cereals, contain between 100 mcg and 400 mcg of folic acid per serving. Look for folate on the Nutrition Facts labels of food packaging.

### HOW MUCH FOLATE IS NEEDED?

**Women of Child-Bearing Age:** In addition to the folate found naturally in their foods, women ages 14 to 50 should get 400 micrograms (mcg) of folic acid daily from fortified foods, vitamin supplements, or both. That amount increases to an additional 600 mcg per day for pregnant women and an additional 500 mcg for women who are breast-feeding.

Easy ways to get this extra folic acid are:

- Take a daily vitamin that has folic acid in it or a folic acid pill that reads "400 mcg" or "100%" next to folic acid on the label.
- Eat a daily serving of breakfast cereal that contains 100% of the daily value for folic acid.

**Women Above Child-Bearing Age, and Males Age 14 and Above:** The Recommended Dietary Allowance for folate is 400 mcg per day from all sources, including fortified foods, vitamin supplements, and the amount occurring naturally in foods.

**Children:** In children and infants, folate helps with overall growth rate. The following age groups should consume these amounts of folate from food:

- 1 to 3-year-olds, 150 mcg
- 4 to 8-year-olds, 200 mcg
- 9 to 13-year-olds, 300 mcg

There is insufficient information on folate to establish a Recommended Dietary Allowance for infants. However, an adequate intake of folate for breastfed infants is 65 mcg for up to six months of age and 80 mcg per day for seven to twelve-month-olds.

## **FOLIC ACID AND PREGNANCY**

Half of all pregnancies in the U.S. are not planned. For that reason, it is very important for a woman to get enough folic acid daily, even when she does not plan to get pregnant. If a woman has enough folic acid in her body before she becomes pregnant, it can help prevent major birth defects of her baby's brain and spine. The neural tube, which forms soon after conception, becomes the baby's spinal cord, spine, brain, and skull. Therefore, folic acid is needed during the first few weeks of pregnancy, usually before a woman even knows she is pregnant.

Nutrition experts advise all women of child-bearing age to consume 400 mcg of folic acid daily from fortified foods, vitamin supplements, or both. This amount should be in addition to folate found naturally in foods that women eat. Unfortunately, most women consume about 230 mcg daily, or half the additional 400 mcg of folic acid that is recommended.

Folate has been shown to help reduce premature births, low birth weight, and a group of serious birth defects to the neural tube. In the United States almost 4,000 babies are born with neural tube defects every year. This number could be slashed by 50-70% if mothers consumed enough folate or folic acid before becoming pregnant, as well as during the first three months of pregnancy.

Neural tube defects can result in both physical and mental disabilities. Spina bifida is a condition in which at least one vertebra does not develop, leaving part of the spinal cord exposed. Anencephaly is a fatal condition in which the upper

end of the neural tube fails to close, and the brain is either totally absent or never completely developed.

Pregnant women should take an additional 600 mcg of folic acid, and women who are breast-feeding should get an extra 500 mcg from fortified foods, vitamin supplements, or both. The safe upper limit of folate is 1,000 mcg daily, or 250% of the DV. However, a woman who has had a baby with spina bifida or anencephaly and wants to get pregnant again should ask her doctor for a higher dose of folic acid.

## **DEFICIENCIES**

Certain people may need extra folic acid to prevent a deficiency. The following medical conditions either increase the need for folate or cause excess folate to be lost through excretion:

- pregnancy
- breastfeeding
- alcohol abuse
- anemia
- malabsorption
- kidney dialysis
- liver disease

In addition, medications can interfere with folate absorption. These include: certain anti-convulsants; metformin (to control blood sugar in diabetics); sulfasalazine (to control inflammation caused by Crohn's disease and ulcerative colitis); triamterene (a diuretic); methotrexate (used for cancer, rheumatoid arthritis, etc.); and barbiturates (used as sedatives).

## **FOLIC ACID SUPPLEMENTATION**

There is no health risk associated with consuming folate found naturally in foods. Since it is a water soluble vitamin, excess amounts of folate and folic acid are excreted in the urine. However, before taking a folic acid supplement, consider whether the diet already includes enough dietary folate and fortified food sources of folic acid.

Do not exceed 1,000 mcg of folic acid per day from vitamin supplements and fortified foods. Too much folic acid can mask symptoms of a vitamin B<sub>12</sub> deficiency that can lead to nerve damage. Because adults 50 years of age and older are at greater risk of having a vitamin B<sub>12</sub> deficiency, they should have their vitamin B<sub>12</sub> level checked by a doctor before

taking a supplement that contains folic acid. If a supplement is taken, it should contain B<sub>12</sub> along with the folic acid. If not, then other B<sub>12</sub> supplementation should be used.

Consult a physician, registered dietitian, pharmacist, or other qualified health professional before taking dietary supplements and inquire about their potential interactions with medications.

Sources:

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7. 4woman.gov, The National Women's Health Information Center, January 2005. <http://www.4woman.gov/faq/easyread/folic-etr.htm>

8. The University of Maine Cooperative Extension Service. *Find Out About Folic Acid*. June 2001.

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This information has been reviewed and adapted for use in South Carolina by J. G. Hunter, HGIC Information Specialist, and K. L. Cason, Professor, State EFNEP Coordinator, Clemson University.

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