

Study addresses concerns about high folate levels

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Taking folic acid supplements or eating fortified grain products is unlikely to worsen problems related to low levels of vitamin B12, according to researchers at the National Institutes of Health and five other institutions in the United States, Ireland and Norway.

In the [United States](#), bread, cereal and other enriched flour products have been fortified with folic acid (the synthetic form of the vitamin folate) since 1998. Women with low levels of folate are at increased risk for conceiving a child with birth defects of the brain and spinal cord known as neural tube defects. The number of infants born with these birth defects has fallen since fortified foods were introduced.

Researchers have been concerned that the level of folic acid in fortified grains — needed to reduce women's risk for conceiving a child with a neural tube defect — might be too high for other people. These concerns stem from earlier studies that found higher rates of anemia and other blood abnormalities in people with low B12 levels who also had high folate levels. The people with low B12 and high folate levels were more likely to have anemia than did people with low B12 levels and normal folate levels.

However, many of these studies were conducted in older people, a group more likely to have difficulty absorbing B12. Researchers were uncertain whether these blood abnormalities were due to the high folate levels or to medical conditions common to older people. For this reason, the NIH researchers conducted the current study in otherwise healthy

younger people to determine if high folate levels alone had an influence on B12 metabolism.

The body uses [vitamin B12](#) to make red blood cells. Because they may have difficulty absorbing sufficient B12, it is recommended that adults over age 50 should take a supplement. People with low B12 levels can develop anemia, a condition in which the body does not make enough red blood cells to carry oxygen throughout the body. They may also develop numbness and tingling in the hands and feet.

"Our findings are reassuring for people who have low vitamin B12 levels," said first author James L. Mills, M.D., M.S., senior investigator in the Division of Epidemiology, Statistics and Prevention Research at the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), the NIH institute that conducted the study. "We found no evidence that folate could worsen their health problems. Consuming higher amounts of folate does not seem to interfere with the body's use of vitamin B12 in otherwise healthy individuals."

Folate is the naturally occurring form of folic acid. Leafy green vegetables, citrus fruits, and beans all are sources of the vitamin.

The NIH researchers theorized that underlying medical problems among elderly participants could have affected earlier results. One such potential problem is pernicious anemia, a condition in which the body does not make enough of the protein needed to absorb B12 from the intestines. Other disorders or a history of intestinal surgery also could hinder the absorption of B12.

For their study, the researchers examined blood samples from a group of B12-deficient university students, screening the samples for conditions that could affect B12 absorption. The researchers found no increase in

anemia rates or blood abnormalities in the high-folate group when compared with the low-folate group.

"In our study, we carefully checked for people who had intestinal surgery or disorders that disrupt the absorption of B12, to be sure that they did not bias our analysis," Dr. Mills said.

Dr. Mills conducted the study in collaboration with nine researchers at the NIH's National Human Genome Research Institute; Trinity College in Ireland; the University of California, Berkeley; the Health Research Board of [Ireland](#); and the University of Bergen, [Norway](#).

Their findings appear in the *American Journal of Clinical Nutrition*.

More than 2,500 university students participated in the study. They reported the amount and type of fortified foods and vitamin supplements they had consumed in the previous week and in an average month. They also provided blood samples.

The researchers found that about 5 percent of the students were B12 deficient. The researchers further divided the students with low B12 into two groups: those with high blood folate levels, and those with low folate levels.

To diagnose anemia, the researchers measured blood levels of the protein hemoglobin. They found that the rates of anemia did not differ significantly between the two groups. Moreover, those with high folate levels did not have higher [blood](#) concentrations of chemicals that are increased when B12 function is abnormal.

"High folate does not appear to increase the risk of anemia among healthy people with low B12 levels," Dr. Mills said.

To reduce their risk of conceiving a child with a neural tube defect, it is recommended that all women capable of becoming pregnant consume 400 micrograms per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.

Provided by National Institutes of Health

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