

Folate and Cancer



Question:

Does folate play a role in preventing cancer?

Answer:

Folate is an essential B vitamin found in fruits, vegetables (especially dark green leafy vegetables), and legumes. Folate is needed for repairing cells, making DNA—the genetic instructions for the body, metabolizing amino acids—the building blocks of protein, and forming red and white blood cells. Folic acid is the supplemental form of folate. Folic acid is used in vitamin supplements, and since 1998, has been added to bread and other grain products in order to decrease the occurrence of neural tube defects in newborns.

The association of folate to cancer is sometimes referred to as a “double-edged sword,” because of a complex relationship that depends on the dosage (amount taken) and timing of exposure to folate. In fact, laboratory studies have found that too little or too much folate may contribute to cancer. In humans, there is some evidence that foods containing folate protect against pancreatic, esophageal and colorectal cancer. However, after folic acid fortification in bread products, Americans were consuming more folate, in the form of folic acid, through food and supplements, causing concern among scientists about possible increased cancer rates, especially for colorectal cancer. However, studies looking at groups of people over time have found that people who take folic acid supplements do not have a higher risk of developing cancer, including colon cancer. On the positive side, they may have a reduced risk of a specific type of skin cancer, melanoma.

Eating foods high in folate is an important part of a healthy diet. Dark green vegetables such as spinach, kale, broccoli, and romaine lettuce, as well as chicory, oranges, papaya, nuts, beans, and peas are particularly good sources of folate. These foods also contain high amounts of fiber, other vitamins, and minerals that are necessary for good health. Most processed grain products, such as bread, cereal, pasta and rice are fortified with folic acid. Folic acid also is present in many multivitamin and prenatal vitamin supplements, and in standard B vitamin supplements. Most American adults obtain the recommended amount of 400 micrograms of dietary folate per day, and do not have to worry about getting enough folate. However,

teenage and young women before and during pregnancy need more folate, about 600 micrograms per day, in order to reduce the chances of their babies developing neural tube and birth defects. These women often need to take folic acid supplements; prenatal vitamin supplements contain folic acid to ensure adequate intake of this critical B vitamin during this period. Sufficient intake of folate through folic acid supplementation also may reduce the risk of stroke, and heart and kidney disease in adults. If you are taking folic acid supplements, keep in mind that the safe upper limit is one milligram (1,000 micrograms) per day.

References, Websites, and Resources:

Mason JB, Dickstein A, Jacques PF, et al. A temporal association between folic acid fortification and an increase in colorectal cancer rates may be illuminating important biological principles: a hypothesis. *Cancer Epidemiol Biomarkers Prev* 2007;16(7):1325-9.

Kushi L H, Doyle C, McCullough M, et al. American Cancer Society guidelines on nutrition and physical activity for cancer prevention. *CA Cancer J for Clin* 2012;62:30-67.

Figueiredo JC, Levine AJ, Crott JW, Baurley J, Haile RW. Folate-genetics and colorectal neoplasia: What we know and need to know next. *Mol Nutr Food Res* 2013;Apr;57(4):607-27.

Qin X, Cui Y, Shen S, et al. Folic acid supplementation and cancer risk: a meta-analysis of randomized controlled trials. *Int J Cancer*. 2013 Sep 1;133(5):1033-41.

World Cancer Research Fund/American Institute for Cancer Research. Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective. Washington DC: AICR, 2007.

Aune D, Chan DS, Lau R, et al. Dietary fibre, whole grains, and risk of colorectal cancer: systematic review and dose-response meta-analysis of prospective studies. *BMJ* 2011;10:343.

Question & Answer written by Lily McWilliams, Indiana University of Pennsylvania. At the time of this writing, Ms. McWilliams was a Wootton High School Student, Student Intern with the Nutrition Science Research Group, National Cancer Institute, National Institutes of Health, Maryland, May 2013, on behalf of the ON DPG.