

## Folates that fight Cancer

Folate is an important B vitamin for metabolic, genetic, nervous system functions, also has immense potential to prevent cancer. It is naturally present in most vegetables, fruits, abundant in breakfast cereals and whole wheat bread, among others.



Courtesy: livestrong.com- breakfast cereal contains folate vitamin

Spinach, broccoli, cabbage, Brussels sprouts, kale, collards and other greens are rich in folate. Vegetarians will not lack folate vitamin.

Folate is an important factor in several metabolic processes, without which may not occur without folate vitamin. You need about 400 micrograms of folic acid or folate in your diet to prevent any deficiency.

Your body proteins are built from dietary amino acids. Folate is required for the conversion of amino acid homocysteine to methionine. Folate deficiency will lead to a build-up of homocysteine in your blood. Elevated homocysteine levels in your blood leads to the risk of developing cardiovascular disease.

**Folic acid is an oxidised synthetic form of Folate, used commercially in supplements and in fortified foods.**

Folic acid taken in supplements and fortified foods when consumed seems to improve the folate status in your body: in short once absorbed into your body, folic acid is converted into metabolically active folate.

### **Folate deficiency**

Folate is a water-soluble B vitamin, and deficiency seems to cause anaemia, thickening of blood vessels (atherosclerosis), cause spine abnormalities (neural tube defects), adverse effects on pregnancies, cause neuropsychiatric disorders, reduces diseases and worst increases the risk of cancer.

Folate is essential to produce new red blood cells, and deficiency can lead to anaemia.

Epidemiological studies show evidence consistently that high intake of dietary folate as a preventive agent lowers the risk and incidence of cancer by 40% in the intestinal tract including the colon, and pancreas

Now let's be more technical and find out how folates can prevent and lower the risk of cancer.

Every cell in your body carries the same genetic information.

It primarily synthesises a chemical called *thymidylate*. This chemical acts as an enzyme to produce the precursor for DNA biosynthesis. Folate also synthesises purines that's needed for DNA replication and repair. The term replication applies to the process occurring in all living organisms to copy their DNA. and multiply.

Folate deficiency in tissues of your body with rapidly replicating cells may result in ineffective DNA synthesis. Such ineffective DNA synthesis replication in tumour cells results in inhibition of tumour growth.

In cancer chemotherapy number of *antifolate agents* such as methotrexate and 5 fluorouracil are used to suppress the growth of tumour cells.

When doctors prescribe methotrexate as an antifolate agent to suppress cancer one should avoid taking foods containing folic acid, such as dark green leafy vegetables like spinach; broccoli; kidney, lima, and lentil beans, peas; beer; whole grains; wheat germ and organs.

Methotrexate in addition being given as an antifolate agent to suppress cancer, is also freely given as a treatment option for rheumatoid arthritis.

### **Methylation of DNA**

Also, adequate folate status is essential for production of S- adenosylmethionine, which is important in methylation reactions, including DNA methylation. DNA methylation is a process by which methyl groups are added to the DNA molecule.

DNA methylation is an epigenetic mechanism that occurs by the addition of a methyl (CH<sub>3</sub>) group to DNA thereby modifying the function of the genes, causing a mutation affecting gene expression. Such methylation of the DNA can induce mutational events and precipitate the development of a large and diverse number of human cancers.

Studies also have shown consuming dietary folate reduces the risk of invasive breast cancer in women. There are contradictory reports that high folate supplementary intake may cause breast cancer risk, and the increase is significant as much as 20%.

**Bottom line**

Be aware that folate deficiency can occur without being aware of the situation. It is sensible to get your folate level in your blood if you have any doubts, and especially there is a history of cancer in your family. Vegetarians and vegans get sufficient folate vitamin and they have no worries. Mainly meat eaters with less green vegetable consumption, should be aware of the risks they could face with.

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