

## Folic Acid

Folic acid is a B vitamin which is vital for the formation of red blood cells. The form of folic acid occurring naturally in food is termed 'folate'. This leaflet will tell you all about folic acid – which foods are good sources, how much you need, and who should take supplements.

### What does folic acid do?

Folic acid, together with vitamin B12, is necessary to form red blood cells. Deficiency of folic acid can cause a type of anaemia (reduced oxygen-carrying ability of red blood cells) called 'macrocytic' (large cell) anaemia. Both vitamins together also help nerves to function properly. Folic acid is also essential in the formation of DNA (genetic material) within every body cell, allowing each cell to replicate perfectly.

### Sources of folic acid

Folate is found naturally in a wide variety of foods and is also present in foods fortified with folic acid. As folic acid is a water-soluble vitamin (dissolves easily in water), it is lost from vegetables during cooking. This can be reduced by avoiding over-cooking and steaming or microwaving vegetables instead of boiling.

### How much do I need?

Men, children and women who are not likely to become pregnant should be able to obtain sufficient amounts of folate in their diet by eating a healthy diet containing a wide variety of foods.

### What happens if I don't get enough?

Folic acid deficiency can result in some general symptoms – tiredness (caused by anaemia), weakness, diarrhoea, loss of appetite and weight loss. Lack of folic acid can also cause headaches, heart palpitations, a sore tongue and behavioural disorders. Deficiency can occur if the diet is inadequate or if requirements increase (such as during pregnancy).



Sometimes deficiency can occur if folic acid losses are excessive (such as Crohns disease or untreated coeliac disease) and from the use of some medications such as water tablets (diuretics), or in alcoholism.

### Pregnancy and lactation (breastfeeding)

The foetus rapidly develops spine and nerve cells in the first few weeks of pregnancy. Inadequate blood levels of folate at this crucial time increase the risk of the baby's spine developing a 'neural tube defect', resulting in spinal malformation called spina bifida.

### Daily recommendations for folate (folic acid) intake ( $\mu\text{g}$ = micrograms)

Adults and children over 11 years:  
200 $\mu\text{g}$

Any woman considering pregnancy:  
200 $\mu\text{g}$  plus a supplement\* containing  
400 $\mu\text{g}$

Pregnant women: 300 $\mu\text{g}$  plus a 400 $\mu\text{g}$   
supplement\* during the first 12 weeks  
of pregnancy

Lactating women: 260 $\mu\text{g}$

\*Some women need to take 5mg/d of folic acid preconception and up to 12 weeks of pregnancy i.e. if you have had a pregnancy previously affected by neural tube defects or if you have diabetes - ask your doctor.

For this reason, every woman considering pregnancy, and up to the 12th week of pregnancy is advised to:

- Take a folic acid supplement, or pregnancy specific vitamin supplement providing 400µg every day
- Eat a diet rich in folates and folic acid from foods naturally containing the vitamin and from fortified foods

During the whole of pregnancy and lactation, it is advisable to eat a diet rich in folate as requirements for the vitamin are higher.

## Folic acid and heart disease

Research has demonstrated that folic acid supplements can reduce high levels of homocysteine – an amino acid in the blood that irritates blood vessels – which has been associated with increased risk of heart attack or stroke.

A high level of homocysteine is found in populations with a high incidence of heart disease, which is the main cause of death in the UK. However reducing homocysteine levels does not reduce rates of heart disease or stroke. Homocysteine level is thought to be an indicator rather than a risk factor for heart disease

## Folic acid supplements and food fortification

Despite recommendations, many women do not take folic acid supplements in early pregnancy. Routine fortification of flour with folic acid is a simple way to increase folic acid intake for everyone. Many countries have introduced mandatory fortification of flour with folic acid, significantly reducing the number of neural tube defect births. The UK has been cautious in recommending this for a number of reasons.

Firstly, although folic acid supplements can correct the anaemia caused by vitamin B12 deficiency, this masks the ongoing damage to nerves caused by B12 deficiency until irreversible nerve damage occurs. Older people are most at risk as uptake of vitamin B12 from diet reduces with age. However, countries with mandatory folic acid flour fortification have not found that more people develop nerve damage as a result of vitamin B12 deficiency since the flour had been fortified.

## Good sources of folic acid:

- spinach, kale, Brussels sprouts, cabbage, broccoli
- beans and legumes (e.g. peas, blackeye beans)
- yeast and beef extracts
- oranges and orange juice
- wheat bran and other whole grain foods
- poultry, pork, shellfish and liver
- fortified foods (e.g. some brands of breakfast cereals – check the label).

Also some research suggests that folic acid at doses greater than 1 mg/day may increase the risk of developing colorectal cancer in people with a history of colorectal cancer or in older people. However recent research has found that high levels of folic acid does not have a significant effect on promoting cancer.

Experts have now considered all of this evidence and have recommended that the UK should fortify flour with folic acid. They have also suggested that there should be controls on voluntary fortification of foods and advice given to people about supplements.

## Can I take too much?

It is advisable for those aged over 50 years or those with a history of bowel cancer, not to take folic acid supplements containing more than 200µg/day. For other people\*, long-term intakes of folic acid from fortified foods and supplements should be below 1mg/day for adults (lower amounts for children).

## Summary

Most people (other than pregnant women/women who could become pregnant) should be able to obtain sufficient folate in their diet by eating plenty of vegetables, fruit, beans and wholegrains. These foods will be naturally high in folate and may protect against bowel cancer and heart disease.



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