

# FLUORIDE

**Other names** Calcium fluoride, sodium fluoride, sodium monofluorophosphate, stannous fluoride

## Availability

Sodium fluoride may be added to drinking water and is available over the counter in single- or multiple-ingredient preparations. Mouth rinses, toothpastes, tablets, gels, and oral drops containing sodium fluoride, sodium monofluorophosphate, or stannous fluoride are available over the counter. Calcium fluoride is a naturally occurring form of the mineral.

## Actions on the body

Fluoride helps to prevent tooth decay and contributes to the strength of bones. It is thought to work on the teeth by strengthening the mineral composition of the tooth enamel, making it more resistant to attack by acid in the mouth. Fluoride is most effective when taken during the formation of teeth in childhood, since it is then incorporated into the tooth itself. It may also strengthen developing bones.

## Dietary and other natural sources

Fluoride has been added to drinking water in many areas, and water is therefore a prime source of this mineral (fluoride levels in water vary from area to area, and untreated water also contains a small amount of fluoride). Foods and beverages grown or prepared in areas with fluoride-treated water may also contribute fluoride. Tea and sea fish are also rich in fluoride.

## Normal daily requirement

No recommended daily amount (RDA) has been established.

## When supplements are helpful

Fluoride supplements are not usually necessary for adults, particularly those who use a fluoride toothpaste, although a dentist may recommend supplements for people who are especially prone to tooth decay. For children, supplements are not generally advised unless the drinking water contains a very low level of fluoride; infants less than 6 months old should not be given supplements even if the drinking water is low in fluoride. In all cases, supplements should only be used on the advice of a dentist. See below for more information about dosage ranges for supplements.

## Symptoms of deficiency

Fluoride deficiency increases the risk of tooth decay, especially in children.

## Dosage range for treating deficiency

Dietary supplements are not usually advised unless the drinking water contains less than 0.7 parts per million (ppm) of fluoride. In such cases, the recommended dosage depends on the level of fluoride in the water and the age of the child; supplements are not recommended for infants under 6 months old. When the drinking water contains less than 0.3ppm, the recommended daily dose of fluoride is: 0.25mg (6 months–3 years); 0.5mg (3–6 years); and 1mg (over 6 years). When the drinking water contains 0.3–0.7ppm, supplements are not recommended for children under 3 years old; the recommended daily dose for older children is 0.25mg (3–6 years) and 0.5mg (over 6 years).

## Symptoms and risks of excessive intake

Prolonged intake of water containing high concentrations of fluoride may lead to mottled or brown discoloration of the enamel in developing teeth, a condition known as fluorosis. Suggestions of a link between fluoridation of the water supply and cancer are without foundation. A child or adult who has taken a number of fluoride tablets may become seriously unwell and eventually lose consciousness. Give milk if the person is conscious, and seek immediate medical help (see p.512).

# FOLIC ACID

**Other names** Folacin, vitamin B<sub>9</sub>, vitamin B<sub>11</sub>, sodium folate, folates

## Availability

Folic acid is available without prescription, alone and in a variety of multivitamin and mineral preparations. Strengths of 500mcg and over are available only on prescription.

## Actions on the body

Folic acid is essential for the activities of several enzymes. It is required for the manufacture of nucleic acids – the genetic material of cells – and thus for the processes of growth and reproduction. It is vital for the formation of red blood cells by the bone marrow and the development and proper function of the central nervous system. Taken before and during pregnancy, folic acid can help prevent neural tube defects in the baby.

## Dietary and other natural sources

The best sources are leafy green vegetables, yeast extract, and liver. Root vegetables, oranges, nuts, dried pulses, and egg yolks are also rich sources.

## Normal daily requirement

The recommended daily amounts (RDA) for folic acid, as folate, in micrograms (mcg) are: 50mcg (birth–1 year); 70mcg (1–3 years); 100mcg (4–6 years); 150mcg (7–10 years); 200mcg (11 years and over). For women planning pregnancy who are at low risk of having a baby with a neural tube defect: 400mcg per day before conception and during the first 12 weeks of pregnancy. Couples are considered to be at high risk of having a baby with a neural tube defect if either partner has a personal or family history of the condition (including a previous pregnancy), or if the woman has a malabsorption disorder such as coeliac disease, or has diabetes, sickle cell disease, or is taking anti-epileptic medication. Women at high risk should take 5mg per day before conception and during the first 12 weeks of pregnancy; women with sickle cell disease should continue taking 5mg daily throughout pregnancy. Daily requirements increase by 60mcg during breast-feeding.

## When supplements are helpful

A varied diet containing fresh fruit and vegetables usually provides adequate amounts. However, minor deficiency is fairly common, and can be corrected by the addition of one uncooked fruit or vegetable or a glass of fruit juice daily. Supplements are recommended for women before and during pregnancy to prevent neural tube defects (see above). Supplements may also be needed in premature or low-birth-weight infants and those fed on goat's milk (breast and cow's milk contain adequate amounts of the vitamin). Doctors may recommend additional folic acid for people on haemodialysis, those who have certain blood disorders, psoriasis, certain conditions in which absorption of nutrients from the intestine is impaired, severe alcoholism, or liver disease. Supplements may be helpful if you are a heavy drinker or if you are taking certain drugs that deplete folic acid. Such drugs include anticonvulsants, antimalarial drugs, oestrogen-containing contraceptives, certain analgesics, corticosteroids, and sulphonamides.

## Symptoms of deficiency

Folic acid deficiency leads to abnormally low numbers of red blood cells (anaemia). The main symptoms include fatigue, loss of appetite, nausea, diarrhoea, and hair loss. Mouth sores are common and the tongue is often sore. Deficiency may also cause poor growth in infants and children.

## Dosage range for treating deficiency

Symptoms of anaemia are usually treated with 5–15mg of folic acid daily, together with vitamin B<sub>12</sub>. A lower maintenance dose may be substituted once the anaemia has responded.

## Symptoms and risks of excessive intake

Excessive folic acid is not toxic. However, it may worsen the neurological symptoms of a coexisting vitamin B<sub>12</sub> deficiency and should never be taken to treat anaemia without a full medical investigation of the cause of the anaemia.