

Vitamin D

This fact sheet is intended to help you understand what vitamin D is, why it is important and how to get your recommended daily intake of this essential nutrient.

What is vitamin D?

Vitamin D is a hormone, but it was first identified as a nutrient found in cod liver oil and so it was called "vitamin D" (vitamin A, some of the B vitamins and vitamin C had been discovered some time before vitamin D was identified)ⁱ.

Vitamin D is unique because it is found in some foods and our bodies can also make it when our skin is exposed to sunlight. However, this only works when the sun is high enough in the sky. In the UK, we can make vitamin D from sunlight from April until September; a good rule of thumb is, if your shadow is shorter than you are, you can make vitamin Dⁱⁱ.

Why is Vitamin D important?

It is used in the absorption of calcium and other minerals, and in the laying down of those minerals into our bones and teeth, helping to keep them healthy and strongⁱⁱⁱ. There is also increasing evidence that having enough vitamin D can help to prevent falls. These two benefits together mean that vitamin D can help prevent bone fractures^{iv}.

Vitamin D is essential to good immunity. Some research shows that we may get more coughs and colds in the winter because we cannot make vitamin D from the winter sun, which means we have lower levels of vitamin D. There is also research that suggests that low levels of vitamin D may be linked to an increased risk of developing heart disease, some cancers, and conditions such as type I diabetes and multiple sclerosis^v.

Every cell in our bodies has specialist receptors which recognise vitamin D. This suggests that it is involved in several different functions, many of which are not yet fully understood. Continuing research shows that there are even more functions of vitamin D to be explored. For example, in muscle function and strength^{vi}; heart function and health^{vii}, the maintenance of healthy blood pressure^{viii} and in mood and reducing depression^{ix}.

Where is it found?

The best source of food containing vitamin D is oily fish, like salmon, mackerel and sardines; eggs and liver are also considered reasonable sources. A single portion of wild salmon contains approximately 20 micrograms, however a single portion of farmed salmon, which is the most commonly eaten variety in the UK, contains only 7.8 micrograms. A single egg contains around 3.2 micrograms of vitamin D.

We can make vitamin D when we expose bare skin to sunshine from late April until September (in the UK) but many people are spending longer in doors and covering up and wearing sunscreen when they go out. This means that many people are not making enough vitamin D in the spring and summer months to last them throughout the autumn and winter. Around 20% of the UK population is deficient in vitamin D. The Government is concerned enough about the health issues this causes that it has made recommendations for the use of vitamin D supplements.



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Recommended intakes

Public Health England recommends that everyone should take a 10 microgram (a microgram symbol looks like this μg) vitamin D supplement, throughout autumn and winter^x, although it believes that food intakes and exposure to sunlight should be enough for most of the population during spring and summer. Vitamin D supplements are widely available from pharmacies, health food shops and most supermarkets. Vitamin D is available as both a food supplement and as a medicine and the measurements used for the two categories are different. As noted, vitamin D in food supplements is measured in micrograms whilst in medicines it is measured in International Units (shown as IU or iu on packaging). 400iu is the equivalent of 10 μg , the recommended intake.

The National Institute for Health and Care Excellence (NICE) believes that there are some people who should take a 10 microgram vitamin D supplement all year round^{xi}:

- People over the age of 65
- Pregnant and breastfeeding women
- Children up to the age of 5
- People who are not exposed to much sunlight (for example living in a care home) or who cover their skin for cultural reasons
- People with darker skins who cannot make vitamin D from the sunlight in the UK as quickly or easily as people with paler skins.

Deficiency

Vitamin D deficiency can lead to a disease called rickets. A lack of minerals in the bone means they can become too soft and bend, particularly the bones of the legs and pelvis. In adults, long-term vitamin D deficiency also makes bones soft, but instead of bending, the bones of the legs, pelvis and lower back will ache, and break easily.

Because vitamin D is involved in so many things in our bodies, there are also lots of other symptoms of deficiency. Tiredness and fatigue, low mood and getting more colds and flu can also be indicators that vitamin D levels are too low.

If you are concerned that you may be suffering from low vitamin D, make sure you eat plenty of oily fish and eggs. If you do not like these foods, vitamin D food supplements are widely available.

Safety and risks

Vitamin D in food is measured in micrograms and food supplements should show their dose in μg on the front of their pack. Most food supplements in the UK are sold in doses of 5 μg , 10 μg or 25 μg although there are some that are higher. Doses over 100 μg are not considered to be safe and in 2018 the UK food supplement industry committed to a voluntary upper level of 75 μg to ensure consumer safety. 75 μg is the equivalent of 3,000iu. It is not considered advisable to take more than this unless recommended by a healthcare practitioner.

Very high doses of vitamin D, taken for a long time, can lead to overly high levels of calcium in the blood. This is called hypercalcemia and it can damage the kidneys and the heart.



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