



Vitamin D supplementation for Infants – Information for Health Professionals.

It is now the policy of the Department of Health & Children and the Health Service Executive that all infantsⁱ, from birth to 12 months, whether breastfed or formula fed, be given a daily supplement of 5 micrograms (5µg)ⁱⁱ vitamin D₃. This should be provided by a supplement containing vitamin D exclusively.

Health professionals advising parents about vitamin D₃ supplements should ensure that they are familiar with the information in this factsheet

What is Vitamin D?

Vitamin D is a fat soluble vitamin and is important because it helps our bodies use calcium to build and maintain strong bones and teeth. Vitamin D is known as the sunshine vitamin because our bodies can make vitamin D from the sun. When sunlight hits our skin, the ultra-violet (UVB) sun rays are used to make vitamin D.

Why give infants in Ireland a vitamin D supplement?

People in Ireland of all ages have low levels of vitamin D⁽¹⁾. It is not possible to safely get all the vitamin D we need from the sun and few foods contain vitamin D.

From October to March in countries at a latitude greater than 42° North little or no vitamin D can be produced due to the quality and quantity of sunlight – Ireland's latitude is 51-55° North.

ⁱ *Some infants who, for example, were born prematurely or who are under on-going medical care may have different vitamin requirements. The specific recommendation of their doctor should be sought and followed in these cases*

ⁱⁱ *5 µg = 200 International Units (IU)*

Infant skin is very sensitive and burns easily and should not be directly exposed to the sun. The Irish Cancer Society recommends that babies skin is not exposed to direct sunlight, and should be protected by clothing, shade and sunscreen. Therefore, infants do not have the capacity to safely get Vitamin D from sunlight. Infant diets do not have enough vitamin D.

Vitamin D deficiency has emerged as a public health problem in Ireland. The incidence of rickets has increased in recent years. Severe and prolonged vitamin D deficiency can cause rickets in children and osteomalacia in adults. Less severe vitamin D deficiency, while not visible or symptomatic, may increase bone turnover and contribute to osteoporosis.

Infants between 0-12 months grow very quickly so may be at greater risk of vitamin D deficiency. Vitamin D supplementation for infants is common practice in countries such as Canada, UK, USA, France, The Netherlands, Germany and Scandanavia, however the level of supplementation varies between countries⁽²⁾.

Vitamin D may also play a role in the prevention of serious chronic diseases such as diabetes mellitus, cardiovascular disease, rheumatoid arthritis and multiple sclerosis as well as some types of cancer.

Are all infants at risk of vitamin D deficiency?

Yes, all infants are at risk of vitamin D deficiency because:

- Newborn infants are dependent on their mother's vitamin D status during pregnancy to build up their vitamin D stores. At birth they only have 50-60% of their mother's vitamin D stores. Recent research has shown that expectant mothers in Ireland are likely to have inadequate vitamin D stores^(3,4,5).
- Infant's diet, whether breastfed, formula fed or taking solid foods (or a combination of these) does not commonly include sufficient vitamin D.
- Direct exposure to sunlight is not recommended for infants and young children because of the risk of skin cancer. The use of sun screens block out the UVB rays needed to make vitamin D in the body. Therefore infants do not have the capacity to safely get vitamin D from the sun.

- Infants' aged 0-12 months are considered at high risk from vitamin D deficiency because they undergo rapid growth during this period.

Infants with African, Afro-Caribbean, Middle-Eastern or Indian ethnic backgrounds are at even higher risk of vitamin D deficiency. Their stores of vitamin D may be particularly low when born as their mother's skin may not be as efficient at making vitamin D from the amount and type of sunlight in Ireland.

Do infants who are breast-fed, formula-fed or taking solid foods (or a combination of these), require a vitamin D supplement?

Yes. All infants from 0 -12 months will need a daily vitamin D supplement to ensure sufficient intake of vitamin D.

If a mother has taken a vitamin D supplement during pregnancy does her infant need to take vitamin D?

Yes. Although infants are dependent on their mother's vitamin D status, they are born with only 50 – 60% of their mother's vitamin D stores so infants will require a vitamin D supplement to ensure that they do not become deficient.

What type of vitamin D supplement is recommended?

Vitamin D₃ (cholecalciferol) is the preferred form of Vitamin D supplement for infants. Parents should use an oral supplement in a **form suitable for infants** (liquid/drop form), **containing only vitamin D₃** and that provides **5 micrograms (5 µg)** of vitamin D₃.

Can multi-vitamin supplements be used?

No. Multi-vitamin supplements should not be used. Using a multi-vitamin supplement increases the risk of overdosing on other vitamins such as vitamin A, particularly where the infant is also on formula feeds. The only vitamin supplement recommend for all babies is vitamin D₃.

Premature infants or infants who are under on-going medical care may require other vitamins or a higher dose of Vitamin D₃. Multi-vitamin supplements or higher doses of Vitamin D₃ should only be used on the advice of a doctor, nurse or dietitian. If a baby is on prescribed multivitamin drops their doctor will advise as to whether they require a vitamin D₃ only supplement as well.

Food Safety Authority of Ireland recommendation:

To ensure that ALL babies get enough vitamin D they should be given 5 micrograms (5µg) of vitamin D₃ every day from birth to 12 months, whether breastfed or formula fed or taking solid foods.

The vitamin D product used should be suitable for infants and should contain only Vitamin D₃.

How much and how often should the supplement be given?

5 micrograms (5 µg) of Vitamin D₃ should be given once a day, from birth to 12 months of age.

A number of suitable infant vitamin D₃ supplements are available to buy in Ireland.

These provide the correct kind of vitamin D₃. A list of these supplements can be found on www.hse.ie.

Important: The number of drops or amount of liquid required to give the recommended 5 micrograms (5 µg) daily is different for each product.

Care must be taken to ensure that the correct recommended dose, as per manufacturer's instructions, is given.

If a dose is missed, then it should be given on the next day and no more than one dose per day should be given. Parents should read and understand the dosage information on the packaging of their chosen product to ensure that the correct recommended dosage, as per the manufacturer's instructions, is given.

Health Professionals should ensure that they are familiar with the different Vitamin D₃ products and the doses required by each product to provide 5 micrograms (5 µg) of vitamin D₃ per day.

Is there a risk of overdose with a Vitamin D₃ only supplement?

Very high amounts of vitamin D are harmful. The recommended 5 micrograms (5 µg) Vitamin D a day is very safe for infants. Harmful effects only begin at levels that are five times higher than the recommended dose.

If the Vitamin D₃ supplement is given in the correct amount according to the manufacturer's instructions and product information, there is no risk of overdose. Giving the correct amount is very important. If parents forget to give their baby their daily vitamin D₃, they should start again the next day – **only one dose per day should be given.**

The safe upper limit for infants for vitamin D is 25 micrograms (25µg) per dayⁱⁱⁱ. In Ireland, the amount of vitamin D recommended for infants is 5 micrograms (5µg) vitamin D₃ per day. This is one-fifth of the safe upper limit for infants. Even infants who are taking fortified formula feeds as well as a 5 microgram (5µg) vitamin D₃ supplement will have a vitamin D intake that is below the safe upper limit of 25 micrograms (25µg) of vitamin D₃ per day.

ⁱⁱⁱ *The European Tolerable Upper limit is 25µg/day (1000IU). The Tolerable Upper Intake Level (UL) is the highest continuing daily intake of a nutrient that is likely to pose no risks of adverse health effects for almost all individuals.*

Are vitamin D₃ supplements available in Ireland?

Yes. A number of suitable vitamin D₃ only supplements are available for infants in Ireland. All food supplements marketed in Ireland for the first time must be notified to The Food Safety Authority of Ireland.

A list of the currently available vitamin D₃ supplements in a form suitable for infants can be found on www.hse.ie. It is likely other suitable vitamin D supplements for infants will become available on the Irish market over time and the Food Safety Authority of Ireland will inform the HSE of these. Details of vitamin D₃ supplements suitable for infants will be available on www.hse.ie.

Where are vitamin D₃ supplements available?

Vitamin D₃ supplements are classified as food supplements and so are available without a prescription. They can be sold in supermarkets as well as pharmacies. They are not available on the medical card or any other state drug scheme. The supplements can be bought by parents/caregivers in pharmacies, in supermarkets or other outlets.

What is the cost of vitamin D₃ supplements?

The cost of Vitamin D₃ supplements will vary depending on the product. The full cost of a vitamin D₃ supplement to the parent will depend on:

- the product chosen,
- how many doses the product contains,
- how long the product will last once open, and
- how many bottles are needed for one year.

Depending on the product more than one bottle may be needed in the year.

What other vitamin supplements are recommended for this age group?

The Department of Health & Children and the Health Service Executive do not recommend any other specific vitamin supplement for infants aged 0 to 12 months. Premature infants or infants who are under on-going medical care may be given other supplements or higher doses of vitamin D₃ by their doctor or dietitian.

Where can I get further information?

For further information visit: www.hse.ie or www.fsai.ie

Information leaflets and posters for parents and carers can be ordered on www.healthpromotion.ie or by contacting your local Health Promotion Department.

PDF versions of the Health Professional factsheet, the HSE Policy document and information for parents/carers in the following languages Irish, French, Polish, Russian, Latvian, Lithuanian, Romanian, Chinese (Mandarin), Arabic, Spanish and Portuguese, are available to download from www.hse.ie or www.healthpromotion.ie

References

- (1) Hill TR, Flynn A, Kiely M, Cashman KD (2006). **Prevalence of suboptimal vitamin D status in young, adult and elderly Irish subjects.** *Irish Medical Journal Feb; 99 (2): 48-49.*
- (2) Food Safety Authority of Ireland (FSAI) (2007). **Recommendations for a National Policy on Vitamin D Supplementation for Infants in Ireland,** *Food Safety Authority of Ireland, Abbey Court, Lower Abbey Street, Dublin 1.*
- (3) Holmes VA, Barnes SM, Alexander HD, McFaul P, Wallace JMW (2009). **Vitamin D deficiency and insufficiency in pregnant women: a longitudinal study.** *British Journal of Nutrition 102: 876-881.*
- (4) O’Riordan MN, Kiely M, Higgins JR, Cashman KD (2008). **Prevalence of Suboptimal Vitamin D Status During Pregnancy.** *Irish Med Journal 240: 242-3.*
- (5) 5. Muldowney S, Cashman KD, Higgins JR, Moore T, Kiely M (2007). Vitamin D status in women living in Ireland at different stages of pregnancy. Proceedings of the Nutrition Society (2007).

Medical terms explained

IU: International Unit:

International Unit is abbreviated as IU and is a unit of measurement for the amount of a substance, based on measured biological activity or effect. The unit is used for vitamins, hormones, some medications, vaccines, blood products, and similar biologically active substances. For **Vitamin D₃, 200 IU = 5 µg** cholecalciferol. Other countries may use the term IU instead of µg.

Under EU law [Directive 2002/46/EC], food supplements for sale in Ireland use µg instead of IU to denote the amount of a nutrient in a product. For example, the amount of Vitamin D₃ in a food supplement will be given in µg.

In Ireland, under EU law [Directive 2002/46/EC], food supplements for sale in Ireland

use μg instead of IU to denote the amount of a nutrient in a product. For example, the amount of Vitamin D₃ in a food supplement will be given in μg .

Microgram:

μg is the abbreviation for microgram. A microgram (μg) is equal to one-millionth (10^{-6}) of a gram. Also abbreviated to mcg. $1 \mu\text{g} = 1 \times 10^{-6} \text{ g}$

Osteomalacia:

A softening of the bones due to a lack of vitamin D or a problem with the body's ability to break down and use this vitamin. It causes soft bones in adults, resulting in frequent bone fractures from minor injuries, muscle weakness and bone pain.

Osteoporosis:

A thinning of bone tissue and loss of bone density over time, also known as brittle bone disease it causes fractures from minor injuries, loss of height and bone pain.

Rickets:

A disorder caused by a lack of vitamin D, calcium, or phosphate. It leads to softening and weakening of the bones, especially in children. It causes severe bone deformities such as bowed legs, abnormal rib-cage and spine curves.

UVB:

Ultra violet B

Vitamin D₃:

also called **cholecalciferol**. It is a form of Vitamin D. Cholecalciferol is manufactured in the skin from the action of ultraviolet B light in sunlight.

Source: MedlinePlus Medical Encyclopedia www.nlm.nih.gov/MEDLINE accessed 18.06.09

