

VITAMIN D IN PREGNANCY



Cordelia Woodward
BSc RD
Freelance Dietitian

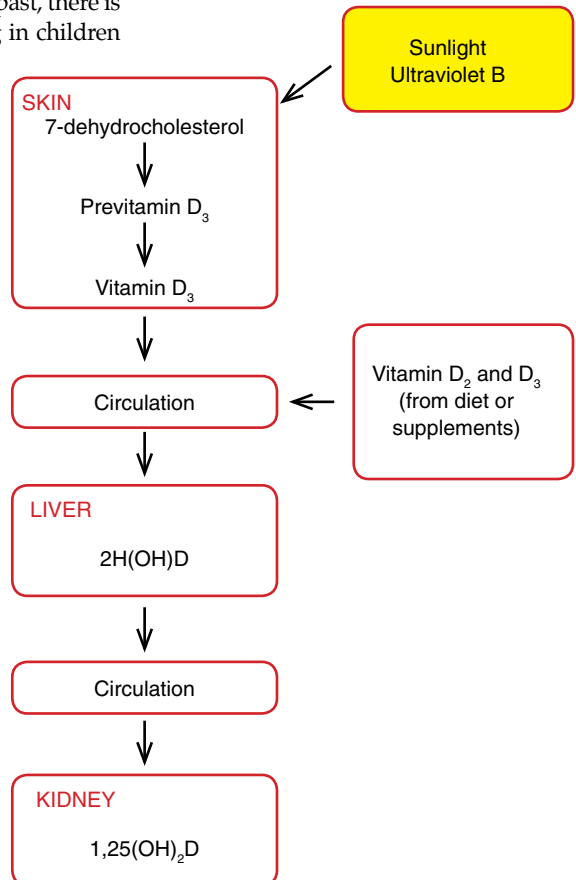
Pregnant women are considered to be at risk of low vitamin D levels amongst other subgroups⁴. There is a close link between a mother's vitamin D level during pregnancy and a new born baby's vitamin D status⁵. The mother needs to ensure adequate stores for herself and her baby.

Adequate stores of vitamin D in pregnancy can help prevent rickets in babies and in infancy (especially for exclusively breast-fed babies)¹. Although we may think of rickets as a problem from the past, there is concern that it is re-emerging in children in the UK⁶. In addition, although not conclusive, some studies have shown vitamin D deficiency may be associated with an increased risk of gestational diabetes, pre-eclampsia, low birth weight and caesarean section⁷.

VITAMIN D: BACKGROUND

Vitamin D is a fat soluble vitamin which plays several important roles within the body. One of its key roles is to help absorb calcium and phosphate and, in doing so, it helps to keep our bones strong and healthy. Whilst we get some vitamin D from dietary sources, we make most of it through the action of sunlight on our skin through a series of reactions (Figure 1). Plasma 25(OH)D (also known as 25-hydroxy vitamin D) concentration is used to assess vitamin D status¹. In the UK, we can

Figure 1: Adapted from (3). 25(OH)D - 25-hydroxy vitamin D; this is used to assess vitamin D status, 1,25(OH)₂D - 1,25-dihydroxy vitamin D - this is the active form of vitamin D.



For article references please visit info@networkhealthgroup.co.uk

Cordelia is a freelance dietitian and owner of www.cwdietetics.co.uk. She has worked previously for NHS trusts as a specialist dietitian and has keen interests in pregnancy, diabetes, weight loss and cardiovascular disease.

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only make vitamin D between April and October (the sunlight is only at the correct wavelength in the summer months) and the latest National Diet and Nutrition Survey (NDNS) highlighted that the UK population has lower levels during the winter months². During winter months the body's stores of vitamin D from the summer and dietary sources are needed to maintain adequate vitamin D status.

REQUIREMENTS

In 1991, the Committee on Medical Aspects of Food and Nutrition Policy (COMA) set a Reference Nutrient Intake (RNI) of 10 micrograms of vitamin D per day for all pregnant and breastfeeding women (COMA, 1991)⁸. The Scientific Advisory Committee on Nutrition (SACN) reiterated the above recommendation in 2007 in their update of vitamin D¹. This is in contrast to most children and adults, for which there is actually no RNI set, as it is assumed they will get enough vitamin D from sunlight exposure⁵. This is, however, currently being reviewed by SACN.

SUPPLEMENTATION

The NICE guidelines advise that UK healthcare professionals should recommend a vitamin D supplement of 10 micrograms for all pregnant and breastfeeding mothers⁹. This is also supported by the Royal College of Obstetricians and Gynaecologists⁷. All pregnant women should be informed about the importance of vitamin D supplementation at their first appointment with their healthcare professional⁵. Some women are at greater risk of vitamin D deficiency, including those with darker skin and women with limited exposure to sunlight and so extra care must be taken to ensure that these women are taking a daily vitamin D supplement⁹.

Whilst the advice for vitamin D supplementation is not new, evidence suggests that it is not necessarily being implemented as well as intended. To highlight this, the Infant Feeding Survey¹⁰ suggested that the majority of women do not take vitamin D supplements during pregnancy.

Vitamin D supplements can be obtained from a pharmacy, a supermarket, or on prescription. They are also included in 'Healthy Start vitamins' (eligible for some women) and 'pregnancy multivitamins.' Although most commercial multivitamins are likely to contain vitamin D, these are best avoided in pregnancy due to their vitamin A content (which can harm the unborn baby). Vegan pregnant women should ensure that their vitamin D supplement is not from an animal origin by checking the label.

Where to get Healthy Start vitamins from:

- Health clinics
- Children's Centres
- Sure Start Centres
- Outreach programmes
- GP surgeries

FOOD SOURCES

Sunlight is the main source of vitamin D and food sources are limited. For most people, diet only provides 10-20% of total vitamin D intake with 80-90% coming from cutaneous synthesis following sunlight exposure¹¹. The main sources are shown in Table 2. Cooking methods can impact the vitamin D content of a food; for example, baking fish has no effect, whereas fry-



Table 2: Sources of vitamin D in the diet (data obtained from Dietplan7, Forestfield Software). µg - micrograms

	Vitamin D (µg) Per 100g
Salmon, fresh, wild	8.60
Salmon, fresh, farmed	4.70
Canned salmon, pink, drained	1.60
Smoked salmon	8.90
Tuna, raw	3.20
Tuna, canned	1.10
Pilchards, canned in tomato sauce	14.00
Mackerel, raw	8.00
Sardines, canned in oil, drained	3.60
Eggs, whole, raw	3.20
Eggs, yolk, raw	12.80
Eggs, white, raw	Nil
Beef, mince, raw	0.70
Fortified breakfast cereals	3.00-8.4
Fortified fromage frais	1.25
Fortified yoghurt	4.00
Fortified fat spreads	5.00-7.5
Fortified dairy free milk alternative drinks	0.75-0.8

ing fish reduces the content by 50%¹². Whilst oily fish is a good source of vitamin D, it must be noted that pregnant women are advised by the government to limit oily fish to twice per week due to pollutants in the fish. The advice is also to limit tuna to no more than four cans per week (or no more than two tuna steaks per

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week) due to the mercury content. Moreover, eggs, another source of vitamin D, need to be thoroughly cooked to prevent the risk of salmonella. Cod liver oil (5µg vitamin D per capsule) and liver (1.1µg/100g) should also be avoided completely during pregnancy due to their high vitamin A content¹³.

High street food retailer Marks & Spencer have recently added vitamin D to their bread and bread rolls, with a minimum of 0.75 micrograms per 100g. It will be interesting to see if other food retailers do likewise.

CAN TOO MUCH VITAMIN D BE HARMFUL?

In the UK, the Expert Group on Vitamins and Minerals reports that taking 25 micrograms or less a day of vitamin D supplements is unlikely to cause any harm¹⁴. Our body does not make too much vitamin D through sunlight; however, individuals need to be aware of sun safety and should cover up/protect skin if they are out for long periods⁴.

ASSESSING VITAMIN D ADEQUACY

There is much debate regarding the appropriate cut-off values for optimal vitamin D status¹⁵; however, the National Osteoporosis Society, in a document entitled *Vitamin D and Bone Health: A Practical Clinical Guideline for Patient Management*, in 2013¹⁶ proposed the following thresholds for bone health with regard to assessing vitamin D status (using 25-hydroxy vitamin D as a marker):

- Less than 30nmol/litre - deficient
- Between 30-50nmol/litre - may be inadequate in some people
- Greater than 50nmol/litre - sufficient for almost the whole population

Whilst not at a national level, several studies have demonstrated that pregnant women have low vitamin D status.

NICE guidelines⁵, on the other hand, define deficient as less than 25nmol/litre.

SCREENING PREGNANT WOMEN

Currently, it is not routine for women to be screened for vitamin D deficiency in pregnancy because there is no data to support this in terms of health benefits or cost effectiveness⁷.

CURRENT INTAKE/STATUS - NDNS

Results from the NDNS 2014 reported evidence of an increased risk of vitamin D deficiency in all age/sex groups. Almost one fifth of UK adults were found to have a low vitamin D status (in this case, defined as less than 25nmol/litre)².

Whilst not at a national level, several studies have demonstrated that pregnant women have low vitamin D status¹. For example, a study by Brough et al (2010) found that 70% of women in their first trimester from a diverse ethnic group in London had 25-hydroxy vitamin D below 50nmol/litre (insufficiency)¹⁵.

In addition, a study on 160 women in South Wales found that 50% of women had levels below 20nmol/litre (deficiency) on their first antenatal visit¹⁷.

SUMMARY

In summary, vitamin D plays an important role in the body, helping to absorb calcium and keep our bones strong and healthy. In pregnancy, having adequate vitamin D can help prevent rickets in babies as well as having other potential benefits.

Pregnant women are considered to be at risk of low vitamin D status, as highlighted in several studies, and the current advice is that all pregnant women take a supplement of 10 micrograms of vitamin D everyday throughout pregnancy and breastfeeding.

Dietitians have a role to play in educating patients about the importance and reasoning behind such supplementation advice and helping to ensure that it is being implemented.

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