Can I get enough vitamin D from the sun?

It is possible to get enough vitamin D from sensible sunlight exposure. The amount of time you need to spend in the sun in order to meet your vitamin D requirements varies according to the time of day. The season and the latitude where you live (how far you live from the equator) are also important factors affecting how much sunlight you need to meet vitamin D requirements. It's important to try to maintain a safe balance between getting enough vitamin D, and minimising your risk of skin cancer (skin cancer authorities advise sun avoidance when the ultraviolet index (UVI) is 3 and above).

Table 3 shows the duration of sun exposure needed for your body to make 1000 IU of vitamin D and the times during the day when you can be in the sun without sun protection. Around 20 to 30 minutes of exposure (with your arms and legs exposed) at around 9 am or 4 pm in summer in most Australian locations is enough (shown in green). In winter, in cities such as Perth and Sydney, it is generally safe to go out in the sun throughout the day, but in cities such as Brisbane and locations further north, spending time in the sun in the middle of the day is not recommended, as the UVI (and risk of sunburn) is too high (shown in red). In these more northerly locations, exposure at around 9 am or 3–4 pm is recommended.

Table 3: Duration of sun exposure (in minutes)[1] to achieve 1000 IU vitamin D

Time of day		AM						PM				
City[2]		7*	8	9	10	11	12	1	2	3	4	5*
Darwin (12.4°S)	Summer	NA	29	11	7	5	4	4	5	8	14	41
	Autumn	NA	34	12	6	5	4	4	5	9	19	NA
	Winter	NA	54	16	8	6	5	5	6	10	23	NA
	Spring	NA	20	9	5	4	4	4	5	8	18	NA
Townsville (19.3°S)	Summer	41	14	7	5	4	4	4	5	8	18	NA
	Autumn	NA	24	11	7	6	6	7	10	18	54	NA
	Winter	NA	42	16	9	7	7	8	12	23	NA	NA
	Spring	35	13	7	5	4	4	5	6	12	35	NA
Brisbane (27.5°S)	Summer	21	10	6	5	4	4	5	7	11	26	NA
	Autumn	NA	20	11	8	7	8	10	15	35	NA	NA
	Winter	221	49	20	13	11	11	15	26	NA	NA	NA
	Spring	25	12	7	6	5	6	7	11	25	NA	NA
Perth (31.9°S)	Summer	47	15	8	5	4	4	4	5	8	15	48
	Autumn	NA	NA	29	17	13	12	15	23	52	NA	NA
	Winter	NA	NA	27	15	12	11	13	19	37	NA	NA
	Spring	27	12	7	5	5	5	5	7	11	25	NA
Sydney (34.0°S)	Summer	28	13	8	5	5	4	5	7	12	27	NA
	Autumn	NA	35	16	11	9	9	12	18	42	NA	NA
	Winter	NA	38	14	8	6	6	8	14	36	NA	NA
	Spring	37	16	10	7	6	7	9	13	27	NA	NA
Adelaide (34.9°S)	Summer	33	13	7	5	4	4	4	5	8	15	42
	Autumn	NA	NA	30	18	14	13	15	22	44	NA	NA
	Winter	NA	NA	61	30	22	20	24	37	NA	NA	NA
	Spring	51	20	11	8	7	7	8	11	20	53	NA
Melbourne (37.7°S)	Summer	39	16	9	6	5	5	5	6	9	15	37
	Autumn	NA	NA	27	16	12	11	13	17	33	NA	NA
	Winter	NA	NA	90	43	30	28	32	48	NA	NA	NA
	Spring	NA	25	14	10	8	9	10	13	23	54	NA

1. Exposure with one side of the hands, arms and neck (11% of the body) exposed to the sun, according to city, season and time of day.
2. Cities are listed from most northern (lowest latitude) to southern (highest latitude).

Ultraviolet Index (UVI) is ≥ 3 (when sun exposure not advised)
UVI is < 3 and required duration of exposure is ≤ 30 min
UVI is < 3 and required duration of exposure is 31–60 min
UVI is < 3 and required duration of exposure is > 60 min

*Sunlight exposure before 7 am or after 6pm not sufficient to achieve 1000 IU of vitamin D.
NA: 1000 IU vitamin D not achievable within the hour

Source: Bilinski KL, Boyages J, Salisbury EI et al. Burning daylight: balancing vitamin D requirements with sensible sunlight exposure. Med J Aust 2011; 194(7):345-8.

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BCI westmead breast cancer institute

PO Box 143
Westmead NSW 2145
T +61 2 9845 6728
F +61 2 9845 7246
www.bci.org.au

NSW GOVERNMENT Health
Western Sydney Local Health District

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Vitamin D and Breast Cancer

Westmead Breast Cancer Institute

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What is vitamin D?

Vitamin D is well known for its essential role in bone health and controlling the body's calcium levels. It is now known that vitamin D is involved in many other important functions, such as regulating the immune system and the prevention of diabetes, heart disease, multiple sclerosis and some cancers (such as breast cancer). Although there is still a lot of research to be done, it is believed that vitamin D may help prevent cancer by controlling the way cancer cells grow and divide.

The body's main source of vitamin D is exposure to sunlight. Only a few foods are naturally good sources of vitamin D and although some foods have vitamin D added to them, the amounts are not high enough to meet our requirements. Your vitamin D level can be measured with a simple blood test.

What is the role of vitamin D in breast cancer?

An insufficient level of vitamin D in the blood is thought to be involved in the development and progression of breast cancer. Research shows that women who have low vitamin D levels have a greater risk of developing breast cancer. In addition, women whose vitamin D levels are low at the time of their breast cancer diagnosis have been shown to have an increased risk of their cancer returning in the future.

Vitamin D also has additional non-cancer benefits for breast cancer survivors such as improvements in bone density, mood and quality of life. Breast cancer survivors may be at an increased risk of low bone density as a consequence of lower oestrogen levels caused by certain types of chemotherapy or medications such as aromatase inhibitors. This is because oestrogen is needed to help bones absorb and maintain calcium for keeping bones strong. In addition, low oestrogen levels that accompany menopause place women at further risk of low bone density. If you are at risk of low bone density it is advisable to have your bone density and vitamin D level checked.

What should my level of vitamin D be?

Many people who live in Australia have blood levels of vitamin D that are too low, primarily because people spend less time outdoors (with less sun exposure) than Australians in the past. This is a particular problem in the winter months as the sun's rays are not as strong as they are in the summer months. Blood levels of vitamin D above 50 nmol/L are traditionally thought to be high enough but many experts believe that vitamin D levels should be above 75 nmol/L to help prevent disease.

Table 1: Criteria for vitamin D deficiency

Vitamin D blood level (nmol/L)	Vitamin D adequacy
> 75	Adequate
50–75	Insufficient
25–50	Mild deficiency
12.5–25	Moderate deficiency
< 12.5	Severe deficiency

How much vitamin D do I need?

The daily recommended intake for vitamin D varies according to your age. The Institute of Medicine in the USA now recommends 600 international units (IU) for people under 70 years, and 800 IU for people over 70. However many experts believe these recommendations are too low to prevent disease and they advise an intake of at least 1000 IU of vitamin D daily to reduce the risk of chronic diseases such as breast cancer. This vitamin D can come from sun exposure or food and supplements.

What are the sources of vitamin D?

The main source of vitamin D for most people is from exposure to sunlight. Food also contains vitamin D, but there are very few foods with enough vitamin D to meet daily requirements. Foods such as oily fish (e.g. salmon, sardines and trout) are good sources of vitamin D. Some foods also have vitamin D added to them (foods 'fortified' with vitamin D), but again, the amounts are not enough to meet daily requirements. The table below shows some of the best food sources of vitamin D.

Table 2: Food sources of vitamin D

Food	Serving size	Vitamin D (IU)
Canned red salmon	75 g	147
Atlantic salmon	1 fillet	420
Reduced fat milk	1 cup	19
Beef fillet	1 small steak	3
Egg	1 whole	14
Sardines	1 small can	384
Supplements		
Omega-3 fish oil	1 capsule	0
Cod liver oil	1 teaspoon	420
Calcium with vitamin D	1 capsule	200–400 (variable)
Multivitamin with vitamin D	1 capsule	50–400
Vitamin D	1 capsule	1000 (variable)

Source: FoodWorks 2009, Version 6.0, Xyris Software and product information

What about vitamin D supplements?

Vitamin D supplements may be beneficial for people who are not able to obtain enough sunlight on a regular basis or in whom sunlight exposure is not recommended. A vitamin D supplement containing at least 1000 IU of vitamin D is safe to consume on a regular basis. It's a good idea to see your doctor to have your vitamin D level checked if you are considering taking supplements. An accredited practising dietitian can also advise on suitable ways to achieve your vitamin D requirements from foods and supplements.