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# Vitamin D In Obesity and Pregnancy

Vitamin D is important for healthy bones. It's also important for muscles, nerves, and the immune system. The body makes it after exposure to sunlight. We can also get it from certain foods.

Many people don't have enough vitamin D. Some people are more at risk of having too little than others are. People who are obese, women who are pregnant, and infants are 3 groups of people at risk. Although other people are at risk too, this newsletter is about vitamin D in these 3 groups of people.

## Vitamin D in Obesity

Obesity means there is excess fat tissue in the body. It's defined by a body mass index (BMI) of 30 or higher. About a third of Americans are obese.<sup>1</sup>

### Obesity Lowers Vitamin D Levels

Scientists have studied vitamin D in obese and nonobese people. In one study, they found that<sup>2</sup>:

- After a dose of UV light, obese and nonobese people had an increase in the amount of vitamin D. But the increase was 57% less in the obese people.
- After an oral dose of vitamin D, the same thing happened. The blood level increased in both obese and nonobese people. But obese people had less of an increase.

So obese people had lower blood levels of vitamin D. It didn't matter how it entered their body.

### Why Obesity Leads to Low Levels of Vitamin D

Scientists believe that vitamin D is stored in body fat. This is because it dissolves better in fat than in water (or blood). But your body can only use the vitamin D that's in your blood. Since obese people have more fat tissue, their bodies store more vitamin D. So there's less in their blood and less available for their body to use. This is the case whether it comes from diet or from being in the sun.



## Others Who Are at Risk

These other conditions or situations may also put people at risk for vitamin D deficiency:

- Having dark skin
- Being elderly
- Being housebound
- Taking certain medications
- Having a condition which limits the uptake of nutrients from the gut

## Know Your BMI and What It Means

Your BMI is a measure of your body fat. It's based on your height and weight. It applies to adult men and women. To find out what your BMI is, go to this online BMI calculator: [nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmicalc.htm](http://nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm). If your BMI is:

- <18.5, you are underweight
- 18.5-24.9, you are at a normal weight
- 25.0-29.9, you are overweight
- 30 or greater, you are obese

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### Vitamin D in Pregnant Women

Many pregnant women don't have enough vitamin D. This is true even if they take a prenatal vitamin. But getting enough vitamin D is important for helping the fetus grow healthy bones. It seems to be important for other things too. Low levels might cause:

- Preeclampsia, which can cause high blood pressure and kidney damage
- Gestational diabetes, a type that occurs only in pregnant women
- Low birth weight (<5½ pounds), the most important cause of infant death
- Need for a Cesarean section
- Problems with lung development in the fetus, which can increase risk of respiratory infections in newborns

### Vitamin D in Infants

During pregnancy, the fetus gets vitamin D from the mother and stores it away. After birth, the infant can use this vitamin D. When it's gone, the infant must rely on getting vitamin D from sunlight, diet, and supplements. Infants who are fed formula usually get enough. This is because vitamin D is added to all formulas. But infants who are only breastfed might not get enough. Human milk doesn't contain very much. So breastfed infants who get very little sunlight are at risk for low levels. Because vitamin D is so important, experts say all infants should get 400 IU/day from food. This should begin soon after birth.

### Getting Enough Vitamin D

Experts don't agree on how much vitamin D we need to get from our diet. But they do think people who are obese need more vitamin D than those who aren't. In fact, obese people may need 2 to 3 times more.<sup>3</sup> This goes for both obese children and adults. Some experts think that pregnant women may need 2 or 3 times more too.<sup>3</sup>

Talk to your doctor to find out how much you need. If you're at risk for deficiency, your doctor might want to test you first to see how much you have. Then he/she can better advise you about how much you need to get.

### Vitamin D from the Sun

We make vitamin D in our skin when we're in the sun. In fact, we can make all we need from sunlight. But the amount we can get from the sun depends on the season. Levels are usually lowest at the end of February. They are usually highest at the end of August. So you may need more exposure to the sun in the winter than in the summer.

Remember, it's important to balance sun exposure with risk of skin cancer. Wear protective clothing and use sunscreen when you're going to be out in the sun for a while. If you are fair-skinned, you might want to protect your skin from the sun all the time. If you do, you'll have to depend totally on your diet and/or supplements for vitamin D.

### References

1. U.S. Department of Health and Human Services. Overweight and obesity statistics. [niddk.nih.gov/health-information/health-statistics/Pages/overweight-obesity-statistics.aspx](http://niddk.nih.gov/health-information/health-statistics/Pages/overweight-obesity-statistics.aspx) Accessed July 17, 2015.
2. Wortsman J, Matsuoka LY, Chen TC, et al. Decreased bioavailability of vitamin D in obesity. *Am J Clin Nutr*. 2000;72:690-693.
3. Holick MF, Binkley NC, Bischoff-Ferrari HA, et al. Evaluation, treatment, and prevention of vitamin D deficiency: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab*. 2011;96:1911-1930.