



## More than half of pregnant women are deficient in vitamin D

Vitamin D deficiency is a risk to health, especially during pregnancy. As part of NRP 69, researchers from the University of Zurich, the University Hospital Zurich and the University of Freiburg (Breisgau) have carried out the first-ever investigation into the vitamin D status of expectant mothers in Switzerland, during which they analysed the role of various factors such as skin type, season, lifestyle or place of residence. More than half the pregnant women who took part in the study had too little vitamin D in their blood. The researchers therefore recommend giving greater priority to vitamin D supplementation in medical practice. Furthermore, patients' risk factors should be assessed more systematically, and vitamin supplements prescribed in line with their individual needs.

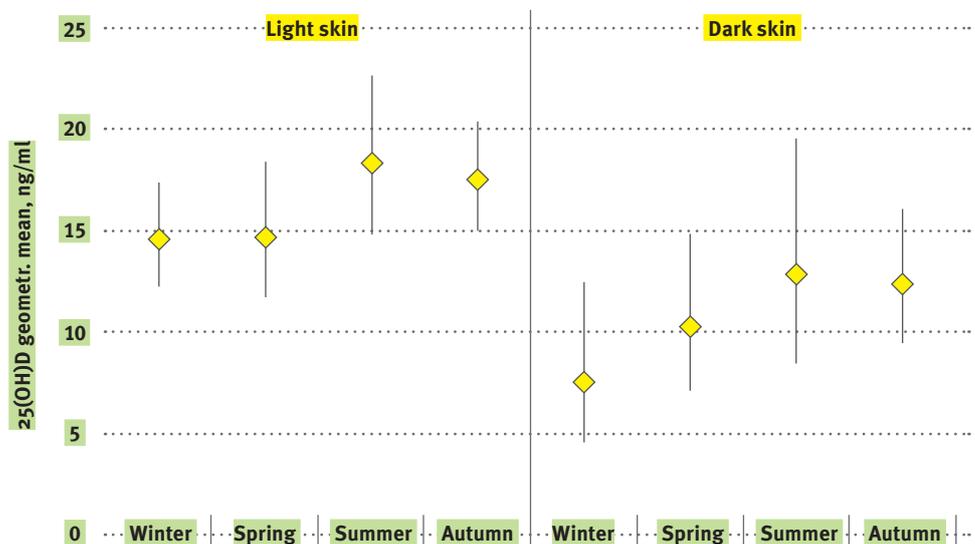
In the human body, vitamin D plays an important role in bone formation and in regulating calcium levels. Deficiency can lead to a variety of diseases including cardiovascular disease, diabetes and some forms of cancer. Vitamin D deficiency can have particularly negative consequences for pregnant women and their children. However, studies have shown that women of child-bearing age frequently have too little vitamin D in their blood. As part of NRP 69, a research group from the University of Zurich and University Hospital Zurich carried out the first-ever investigation of vitamin D status among

pregnant women and their babies in Switzerland. In the course of their research, they analysed various risk factors for vitamin D deficiency. Because the body is able – through exposure to sun – to produce most of the vitamin D it needs, particular attention was paid to the issue of how skin pigmentation affects vitamin D status.

### Women with dark skin at high risk

The researchers analysed vitamin D levels in volunteers' blood at an early stage or in the last trimester of pregnancy. The pregnant women were also asked to complete a lifestyle and skin

Mean vitamin D levels in early pregnancy by season and skin type



The geometric mean vitamin D levels measured in volunteers' blood during early pregnancy varied according to season and skin colour. Concentrations were highest during the summer months in both dark-skinned (12.9 ng/ml) and light-skinned (18.3 ng/ml) women. By contrast, deficiencies were much more pronounced in winter and spring. Women with a darker skin pigmentation had a lower vitamin D status at all times of the year than light-skinned women.

type questionnaire. University Hospital Zurich recruited 204 women between the sixth and twelfth week of pregnancy for the study. At this early stage, two-thirds of them were deficient in vitamin D, with a median vitamin D concentration of 17 nanograms per millilitre of blood. Deficiency was most common among dark-skinned women originating from South-East Asia (88.5%, average concentration 8.4 ng/ml) and from Africa and the Middle East (91.4%, 10.7 ng/ml). Light skinned women who were born in Germany and Switzerland were found to be at considerably lower risk of vitamin D deficiency. In general, ex-smokers and women who took vitamin D supplements were significantly less likely to be deficient. Finally, the researchers found that women who were due to give birth in the summer or autumn faced a lower risk of deficiency (see chart). This is due to the higher levels of sunlight during the six months of the year that include summer, when endogenous vitamin D production is greater.

The examinations during the final trimester of pregnancy produced similar results. 53.4% of the 305 women who were tested were deficient in vitamin D. The median vitamin D concentration was 18.4 ng/ml. In all cases, the mothers' vitamin D status correlated strongly with the vitamin D levels measured in their babies' cord blood. In contrast to the tests carried out in early pregnancy, the researchers recruited women from maternity hospitals in three different towns – Zurich, Bellinzona and Samedan – with different altitudes and climates. The expectant mothers from Bellinzona were at lowest risk of developing vitamin

Further information: [www.nrp69.ch](http://www.nrp69.ch)

### Vitamin D-enriched food yields benefits

The USA, Canada and Finland add synthetic vitamins, including vitamin D, to foods such as milk products or orange juice. Studies from these countries show that doing so can have a beneficial effect on vitamin D levels among the population at large. For example, milk products provide 28–63% of total vitamin D intake in these countries. As a result, deficiencies are less common, particularly among dark-skinned people.

D deficiency. The researchers attribute this to the greater number of hours of sunshine in Ticino.

The projects showed clearly that vitamin D deficiency is widespread among pregnant women in Switzerland. Dark-skinned women with South-East Asian or African roots are particularly affected. It is noteworthy that over 50% of women were still deficient in vitamin D towards the end of their pregnancy, even though most said they were taking supplements. Either the vitamin supplements the women had been prescribed were underdosed or they did not take them regularly. The researchers feel the latter is more likely explanation. They recommend giving vitamin supplements greater priority in clinical practice and adapting prescribing habits accordingly.

### Recommendation

## Carry out a systematic risk analysis for vitamin D deficiency

In the light of their results, the researchers conclude that current Swiss guidelines on vitamin supplementation do not adequately protect pregnant women from vitamin D deficiency. Their recommendations are as follows:

- Staff in hospitals and doctors' practices should be better informed about the importance of vitamin D supplementation. Guidelines should be adapted accordingly.
- Each patient's susceptibility to vitamin D deficiency should be analysed. The various factors such as skin type, season, lifestyle or place of residence should be brought together in a systematic risk assessment that will enable health-care professionals to adapt the supplements they prescribe to patients' individual needs.
- Vitamin D deficiency often occurs in combination with other deficiencies. Multivitamin supplements are therefore recommended for certain patients.