

# Study indicates link between high vitamin D levels in expectant mothers and increased infant allergy risks

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Pregnant women should avoid taking vitamin D supplements. Substitution appears to raise the risk of children developing a food allergy after birth. This was the conclusion drawn from a new survey carried out by the Helmholtz Centre for Environmental Research and the Martin Luther University in Halle-Wittenberg in Germany which was published in the February issue of the medical journal *Allergy*.

[Vitamin D](#) has always had a good reputation: it strengthens bones, protects against infections particularly during the [cold winter](#) months and aids the nervous and muscular systems. Especially in the prevention and treatment of rickets, it has been given to babies and infants around the world for around 50 years. However, recent scientific investigations are increasingly questioning the positive aspect of the "bone vitamin". At the end of the 1990's, for the first time people's attention was drawn to a link between high [vitamin D](#) levels and the development of allergies.

To pursue the problem, together with Prof. Gabriele Stangl's group from the Institute of Agricultural and [Nutritional Sciences](#) at the Martin-Luther University in Halle-Wittenberg, Dr. Kristin Weiße from the Helmholtz Centre for Environmental Research in Leipzig devoted herself to the following task: can it be proved that there is a [correlation](#) between the concentration of vitamin D in the blood of expectant mothers and in cord blood of the babies? The researchers from the UFZ in Leipzig were furthermore interested in the association between vitamin D levels during pregnancy and at birth, the immune status and [allergic diseases](#) of the [children](#) later in life. Or, in other words: does the vitamin D level of [pregnant women](#) affect the allergy risk of their children?

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Lehmann. In total, it was possible to include 622 mothers and their 629 children in the long-term study "Lifestyle and environmental factors and their impact on the newborn allergy risk". The level of vitamin D was tested in the blood of the pregnant mothers and also in the cord blood of the children born. In addition to this, questionnaires were used to assess the occurrence of food allergies during the first two years of the children's lives.

The result was clear: in cases where expectant mothers were found to have a low vitamin D level in the blood, the occurrence of food allergies among their two-year old children was rarer than in cases where expectant mothers had a high vitamin D blood level. In reverse, this means that a high vitamin D level in pregnant women is associated with a higher risk of their children to develop a food allergy during infancy. Furthermore, those children were found to have a high level of the specific immunoglobulin E to food allergens such as egg white, milk protein, wheat flour, peanuts or soya beans. The UFZ scientists also got evidence for the mechanism that could link vitamin D and food allergies. Dr. Gunda Herberth – also from the Department of Environmental Immunology at the UFZ – took a closer look at the immune response of the affected children and analysed regulatory T-cells in cord blood in particular. The cells are capable of preventing the immune system from overreacting to allergens, with the result that they protect against allergies.

The UFZ researchers know from earlier analyses that the allergy risk increases in cases where too few regulatory T-cells are present in cord blood. The interesting result of the current research project: the higher the level of vitamin D found in the blood of mothers and children, the fewer regulatory T-cells could be detected. The correlation could mean that vitamin D suppresses the development of regulatory T-cells and thus increases the risk of allergy.

Apart from diet, Dr. Kristin Weiße explained that the level of vitamin D is mainly affected by conditions such as season, exposure to the sun and the amount of time spent outdoors - these factors were also taken into account in the current risk analyses of vitamin D and food allergy. Even though the occurrence of food allergies is undoubtedly affected by many other factors than just the vitamin D level, it is still important to take this aspect into consideration. The UFZ researchers would rather advise pregnant women not to take vitamin D supplements. "Based on our information, an excess of vitamin D can increase the risk of children developing a [food allergy](#) in the first two years of their life."

**More information:** Weiss, K. et al. (2013). Maternal and newborn vitamin D status and its impact on food allergy development in the German LiNA cohort study. *Allergy* 68 (2), 220 – 228.  
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