

## ***Should Australia & New Zealand allow more vitamin D into the food supply?***

### **FACT SHEET:**

#### **Abstracts for Australian Academy of Science National Committee for Nutrition Symposium**

**When:** 9 am to 3.30 pm, Tuesday **12 June 2012**

**Where:** Deakin City Centre, Level 3, 550 Bourke Street, Melbourne

**Program:** <http://science.org.au/natcoms/nc-nutrition/documents/ILSI-Vit-D-meeting-program.pdf>

#### **Impact of Vitamin D on health and increasing its content in the food supply of Australia**

Vitamin D deficiency and insufficiency have recently emerged as a widespread public health issue in Australia and most industrialized societies, where in winter between 30 per cent and 75 per cent of the population have insufficient levels of vitamin D. In addition to the effects on bone health vitamin D has now been implicated the development of a wide range of diseases including cancer, cardiovascular disease, ability to fight infections and schizophrenia. The introduction of a modest amount of vitamin D into the food supply, through mandatory fortification of a key food type/s combined with voluntary fortification of a range of foods would raise the vitamin D status of the population. This strategy is likely to reduce the number of people who fall into the frank deficiency range. Australia has one of the highest rates of skin cancer in the world and it is difficult for many sections of the population to achieve sufficient safe sun exposure to achieve adequate vitamin D status, without increasing their risk of skin cancer.

#### **Vitamin D status of Australian adults**

In a population-based study) involving 11,247 Australian men and women aged  $\geq 25$  years from 42 randomly selected districts around the country who provided a blood sample in 1999/2000, reported that 31 per cent of the population were vitamin D deficient, however, only 4 per cent had moderate-to-severe deficiency. Further analysis revealed that the prevalence of deficiency was nearly double in women (39 per cent vs. 22 per cent in men) and increased significantly with age and was more common in Non-Europids (3.5 to 4.7-fold increased risk) and more common during winter.

#### **How effective is sunlight exposure in maintaining adequate vitamin D status in Australians?**

A significant proportion of the population has been found to have inadequate vitamin D status. Vitamin D is made in skin and important factors which predict vitamin D status are skin type, because darker skin contains a lot of melanin pigment which absorbs UV; time spent out in the sun and how much skin is exposed when outside. Although use of sunscreens in the laboratory reduces vitamin D synthesis, in practice, sunscreen use does not greatly affect vitamin D levels, at least in part, because of sub-optimal application. People in Australia who expose their arms and hands to one-third of the amount of UVB that would just cause faint redness, on most days, at least in summer, should be sufficient to maintain adequate vitamin D status. However in winter particularly in areas further away from the equator, for example New Zealand, it would be very difficult to achieve sufficient sun exposure. Australia has the highest rates of skin cancer in the world, so that caution about sun exposure is appropriate for all people and particular caution for people at high risk of skin cancer. It should also be recognized that vitamin D synthesis in skin is also affected by genetic factors.

#### **Vitamin D status of dark skinned migrant populations and indigenous Australians**

Vitamin D deficiency and insufficiency is common in dark skinned populations and that following migration to Europe or Australia, their vitamin D status does not improve. Their vitamin D status remains significantly lower than that of the host populations, and in some cases lower than that of the populations in countries of origin. These findings suggest that dark skinned population are at increased risk of vitamin D deficiency and sun exposure is not sufficient enough to improve vitamin D status. Alternative effective ways of addressing vitamin D deficiency in populations at risk need to be explored.

### **Canada's experience with Vitamin D**

Canada has had mandatory fortification of milk and margarines for the past 35 years. In the 1960s hundreds of cases of rickets were appearing in some hospitals. After implementing a mandatory policy, cases of rickets dropped off. In a national survey conducted recently the major determinant of vitamin D status was fortified milk, especially for children. A more varied approach to fortification is needed enable the population to obtain daily intakes closer to the recommended intakes.

### **Emerging areas relating Vitamin D to health**

Vitamin D deficiency has also been associated with other diseases, including type 1 and type 2 diabetes mellitus, Crohn's disease, rheumatoid arthritis, multiple sclerosis, colon and breast cancer, hypertension and cardiovascular disease, infectious diseases, including tuberculosis and influenza, and mortality. However, the level of evidence of benefit from vitamin D supplementation in preventing these diseases is largely lacking. The optimal level for vitamin D status is controversial with some agencies recommending serum 25(OH)D above 50 nmol/L and some recommending levels above 75 nmol/L. At least 600 and 800 IU of vitamin D<sub>3</sub> per day would be required raise serum 25(OH)D above 50 nmol/L, but to reach 75 nmol/L. the amount required may be at least 1500–2000 IU per day. For some cancers (prostate and pancreatic cancer) and some mental health disorders, the risk of disease is increased at both lower and higher serum 25(OH)D concentrations. Taken together with an increased risk of falls after high annual doses of vitamin D, it suggests high serum 25(OH)D concentrations may not be beneficial for health in all individuals. On the other hand, based on current evidence, the serum level required for prevention of multiple sclerosis may be higher than that for musculoskeletal benefits.

### **Vitamin D, brain outcomes and non-linear exposure-risk relationships**

In recent years there has been growing evidence linking vitamin D status and brain-related outcomes including mood disorders, dementia and Parkinson's disease. There is also evidence linking low vitamin D during early life and risk of schizophrenia and autism. It has recently been shown that both low and high vitamin D concentrations are associated with an increased risk of schizophrenia. Several studies based on the association between vitamin D status and a range of adverse health outcomes (e.g. mortality, immune function, low birth weight) have also reported reverse J- or U-shaped exposure-risk relationships.

### **Regulating Addition of Vitamin D to Food**

The amount of Vitamin D that can be added to foods and the type of foods which may have vitamin D added is regulated. Currently a small range of foods are permitted to have vitamin D added in small amounts. It is mandatory that margarine contains a small amount of vitamin D and vitamin D may be added to low fat milk in very low levels. The process to all change the food legislation is a complex and lengthy process.

### **Food Sources of Vitamin D: natural occurring and fortified foods**

Food and supplement manufacturers alike are responding to the new dynamics generated by the new science and the growing awareness. Food products with relevant inclusions of Vitamin D are predicted to enjoy a widening consumer appeal.

Store-bought mushrooms are able to generate over 20 mcg per serve after being placed in sunlight for a couple of hours in the midday sun. Farmers generally don't subject their mushrooms to light other than during growing operations and harvesting, so cultivated mushrooms are low in vitamin D. However, if cultivated mushrooms are exposed to a short burst of ultraviolet light they quickly generate vitamin D. Vitamin D-enhanced mushrooms are in supermarkets in the US and Canada, and are now becoming available in Australia capital cities. A single serve of mushrooms (100g: 3 button mushrooms) typically provides 20 mcg of vitamin D.

To arrange interviews with the scientists who are speaking to these topics, please contact:

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