

**Irreconcilable Differences Part 2 of 4****June 2010****☀ The Vital Nature of Vitamins**

The term vitamin is historically derived from the Latin term “*vitamine*” (also the current French spelling), the combination of “*vita*” meaning “life” and “*amine*”, a nitrogen-containing organic compound. When it was later determined that these disease-preventing bioactives are not amines, the English term was morphed to ‘vitamin’. As vitamins were sequentially discovered, they were given a “nickname” in addition to their chemical name, in descending order from the Roman alphabet, from A to E. The break in the sequence occurred with the discovery of Vitamin K in 1984, so named to indicate the German and Scandinavian word “Koagulation”, the major function of this compound.

**☀ Progressive Vitamin D Discoveries**

The first isolated vitamin D product, discovered during the 1920’s, resulted from photosynthetic irradiation of the fungus-based compound fungal sterol ergosterol. It was known as Vitamin D until the discovery that it was a combination of several substances. Further purification yielded a single compound, hence called Vitamin D<sub>2</sub>. For a period of time it was assumed that the vitamin D produced photosynthetically in human skin from exposure to sunlight was vitamin D<sub>2</sub>. During the 1930s, a new vitamin D compound with a side chain of cholesterol was discovered, called cholecalciferol, or to follow the numerical sequence, Vitamin D<sub>3</sub>. Animal-based Vitamin D<sub>3</sub> was found to be chemically similar to the vitamin D in fish liver oils and in mammalian skin.

**☀ The Invaluable Contribution of D<sub>2</sub>**

The plant-based Vitamin D<sub>2</sub> manufacturing process was patented in the 1920s, followed by access to large quantities of this compound. Widespread fortification of fluid milk with Vitamin D<sub>2</sub>, initiated in the 1930’s in North America and Europe, successfully eliminated the bone-disease rickets. Present day fortification of milk with either metabolite has eradicated infantile rickets. Vitamin D<sub>2</sub> continues to be the metabolite used in major pharmaceutical prescriptions in North America. However, recently, Vitamin D<sub>3</sub> has become available, and the metabolite of choice for fortification and supplementation.

**☀ D<sub>2</sub> or D<sub>3</sub>?**

Large quantities of animal-based vitamin D<sub>3</sub> is produced through irradiation of 7-dehydrocholesterol extracted from lanolin in sheep’s wool. Current marketplace preference for D<sub>3</sub> over D<sub>2</sub> owes to the fact that provitamin D in mammalian skin is a D<sub>3</sub> metabolite. However, both D<sub>2</sub> and D<sub>3</sub> metabolites are inherently biologically inactive, until a two-step process involving first the liver, then the kidney, converts each to calcitriol, the most active form of Vitamin D. Regulatory authorities worldwide accept the biological equivalency of the two metabolites for both fortification and supplementation purposes. However, in 2006, two leading Canadian nutritionists published their disapproval of Vitamin D<sub>2</sub>, concluding “Vitamin D<sub>2</sub> should not be regarded as a nutrient suitable for supplementation or fortification” while acknowledging the critical role of Vitamin D<sub>2</sub> to human health before Vitamin D<sub>3</sub> was widely available. (See Websites). As is customary, for every study that concludes Vitamin D<sub>3</sub> superiority, another soon surfaces to render Vitamin D<sub>2</sub> trump card.

**☀ Niche Nimbleness**

Fortification of plant-based beverages (soy, almond, oat, etc.) with Vitamin D is voluntary. The metabolite of choice by supplier and buyer of these products is exclusively plant-based D<sub>2</sub>, so as to derive a complete plant-based product.

**☀ Is a Re-think Required?**

As epidemiological evidence from North America and Europe consistently and convincingly indicates a startling Vitamin D deficiency among all age groups, including re-emergence of rickets among children, is there a need to expend scarce resources discrediting either metabolite? **FF**

**☀ Some Web sites**

<http://www.ajcn.org/cgi/content/abstract/84/4/694> ranked 6<sup>th</sup> amongst the “50 most read AJCN articles”)

<http://www.whfoods.com/genpage.php?tname=nutrient&bid=110>

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