DFFG (Deficiency Free Future Generations)

Even though the UAE is 2,796 km away from the equator, one of the main problems 90% of its citizens face in their daily life is Vitamin D deficiency. The perfect geographic location, the huge amount of exposure to the sun, and the olive skin tone of most Emiratis would make you expect that they don't face that issue, the reason behind Emiratis not having enough of Vitamin D is the high temperature pushing everyone to stay sheltered inside away from the flaming sun. Vitamin D deficiency can have vital consequences on our health, mostly our bone health. Due to this deficiency, calcium absorption cannot be increased enough to satisfy the body's calcium needs, resulting in bone weakness. Vitamin D deficiency also results in muscle weakness, depression, often infections, hair loss, diabetic problems and many other things.

When UVR-B (Solar Ultraviolet Radiation - B) light hits our skin, the process of Vitamin D production starts. The contact between the light and the epidermis of the skin stimulates the production of Vitamin D3 from a 7 dehydrocholesterol. When exposed to UVR-B radiation, a form of Vitamin D3 called cholecalciferol is synthesized and further transported through the blood stream to the liver. The liver then converts cholecalciferol to calcidiol and then to calcitriol, which is the active chemical form of the vitamin in the kidneys.

The importance of Vitamin D and the lack of it in our bodies triggered our idea of this project, an affordable simple solution that will guarantee a deficiency free future generation. As we know, the Solar Ultraviolet Radiation has a wavelength of 280-315 nanometers. Our simple solution is infusing this UVR-B radiation in the room lights. Those lights will also be connected to a timer, guaranteeing that each skin tone doesn't have more Vitamin D than it needs. Considering the fact that each skin tone needs a different amount of time to expose their skin to those radiations. Since Vitamin D depends highly on the amount of Melanin in the skin, as

Melanin is responsible for absorbing UVR-B lights. The darker the skin, the more Melanin is found in the skin. Meaning people with high amounts of Melanin in their skin (dark skin tones) will face slower production of Vitamin D in their bodies. Meaning they will have to endure sun exposure in a much higher rate. We will consider having 3 categories in which each type of skin tone has a different timing of timer (5, 15 and 25 minutes) attached to the UVR-B radiation light bulbs. Thus, the UVR-B light bulbs will trigger the production of Vitamin D3 as explained previously, making sure each skin tone gets exposed to a suitable amount of time.

Our project is an easy, efficient and important solution to the problem of Vitamin D deficiency. Even though it is a simple solution that doesn't require excessive or complicated procedures, it will help in guaranteeing a "deficiency free future generations".

Citation

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