Taking vitamin D3 (cholecalciferol) containing supplements with a meal providing some fat may enhance vitamin D absorption by up to 32%.

Taking your vitamin D3 supplement with a meal containing fat increases absorption

Vitamin D is a fat-soluble nutrient that is found naturally in very few foods (oily fish, egg yolk, and beef liver), fortified in others, and produced in the skin from exposure to sunlight. Skin exposed to sunshine through a window, on cloudy days, in shade, having a tan or dark-colored skin, and using sunscreen can decrease the amount of vitamin D the skin makes. Recent studies have shown that sunshine levels in some northern latitudes are so weak during the winter months that humans make little to no vitamin D. Data suggests that, despite foritification, many people do not get enough vitamin D from diets alone.

Vitamin D supplements may help bridge the gap. Because vitamin D is fat soluble, it seems logical that vitamin D supplements should be taken with a meal containing some fat. However vitamin D absorption differences based on dietary composition has been poorly understood.

A new study published in the *Journal of the Academy of Nutrition and Dietetics* sought to test the hypothesis that absorption of vitamin D3 improves when taken with a meal containing fat compared to a fat-free meal. In this study researchers recruited fifty healthy older men and women to complete this one day study and randomly assigned them to one of three meal groups: the first group consumed a fat-free meal; and the second and third groups consumed a meal with 30% of calories from fat but each provided a different ratio of MUFA's (monounsaturated fatty acids) to PUFA's (polyunsaturated fatty acids). After completing a 12-hour fast, all subjects took a single 50,000 IU vitamin D3 supplement with their test breakfast. Plasma vitamin D3 levels were collected and measured by liquid chromatography–mass spectrometry before the meal and 10, 12, and 14 hours after consuming the meal and supplement.

The results showed that the maximum vitamin D3 plasma level (12-hour time-point) was 32% higher in subjects consuming the fat-containing meals compared with the fat-free meal. Absorption did not differ significantly at any time point between the high and low MUFA and PUFA groups.

This study provides a better understanding of the importance of some type of fat in a meal to optimize the absorption of vitamin D3 (cholecalciferol) from supplements; however the type of fat consumed is not significant for absorption.

Dawson-Hughes B, Harris SS, Lichtenstein AH, Dolnikowski G, Palermo NJ, Rasmussen H. Dietary Fat Increases Vitamin D-3 Absorption. J Acad Nutr Diet. 2014 Nov 17.