

# Abstract

J Nutr. 2010 May;140(5):915-8.

## Beta-carotene conversion to vitamin A decreases as the dietary dose increases in humans.

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**OBJECTIVE:** It has been suggested that high doses of beta-carotene limit its conversion to vitamin A, yet this effect has not been well established in humans.

**METHODS:** A feeding study was conducted in a randomized crossover design in which volunteers consumed 2 doses of deuterium-labeled beta-carotene on 2 occasions, with beta-carotene and vitamin A response assessed by plasma area under the concentration time curve (AUC). Seven volunteers (4 men, 3 women) consumed each of 2 doses of beta-carotene-d8 and provided serial blood samples for 37 d after each dose. beta-Carotene doses were 20 and 40 mg. Plasma beta-carotene-d8 was assessed by HPLC-MS. Plasma retinol (ROH)-d4, which was derived from the beta-carotene-d8, was evaluated by GC-MS after saponification to convert retinyl esters to ROH prior to the formation of the trimethylsilylether.

**RESULTS:** The plasma AUC for beta-carotene-d8 increased 2-fold from the 20-mg dose to the 40-mg dose. The plasma AUC for ROH-d4 increased 36% from the 20-mg dose to the 40-mg dose.

**CONCLUSION:** These results establish that, in humans, beta-carotene conversion to vitamin A decreases as the dietary dose increases.

PMID: 20237064

