

Thesis Title	Serum betacarotene in normal Thais after ingestion of betacarotene capsule and betacarotene-rich food.
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### ABSTRACT

Betacarotene is a natural nutrient called as provitamin A. It is found in dark green and yellow to orange vegetables and fruits and is used as food colorant. Nowadays it is suggested to be used as vitamin A supplement and cancer prevention and a commercial dosage form is available. In Thailand, there is no report of betacarotene serum level in Thai people to support the clinical use of betacarotene. Accordingly, the study was performed to investigate serum level of betacarotene in healthy Thai volunteers who were on usual diet. A comparison of betacarotene serum level between a single ingestion of 15 milligrams of betacarotene capsule and carrot containing 15 milligrams of betacarotene was carried out. The study also attempted to determine relationship between diet behavior and baseline betacarotene serum level.

Twenty healthy Thai volunteers (9 female, 11 male), whose age between 20-30 years were included in the study. They were asked to record amount and type of food taken during 7 days prior to the study day. On the study day, betacarotene in a single dose of 15 milligrams was administered to each volunteer in the form of either betacarotene capsule (Betacar-15<sup>®</sup>) or betacarotene-rich food (carrot), once at a time with one month wash-out period. Five millilitres of blood were withdrawn at 0, 1.5, 3.0, 4.5, 6.0, 9.0, 12.0 and 24.0 hours postdose and kept at -70°C before analysis of betacarotene in serum by high performance liquid chromatography.

The baseline betacarotene serum level after usual diet was  $0.255 \pm 0.110$  micrograms per millilitre (mean  $\pm$  SD). Daily dietary betacarotene in this population was  $1.52 \pm 0.96$  milligrams. The mean  $\pm$  SD peak concentration after ingestion of betacarotene 15-milligram capsule was  $0.303 \pm 0.177$  micrograms per millilitre and reached at 12 hours. In case of carrot, mean  $\pm$  SD peak concentration of  $0.312 \pm 0.163$  and  $0.312 \pm 0.162$  micrograms per millilitre appeared at 4.5 and 12.0 hours postdose, respectively. However, each volunteer showed different peak time which varied from 4.5-24 hours. Betacarotene serum level after ingestion of betacarotene capsule and carrot were similar at any sampling time. The mean  $\pm$  SD area under the concentration-time curve during 24 hours postdose were  $6.14 \pm 2.66$  and  $6.87 \pm 3.37$  micrograms hour per millilitre for betacarotene capsule and carrot, respectively and were not significantly different. Female volunteers responded to the ingestion of either betacarotene capsule or carrot more than the male volunteers. Female volunteers

had higher serum level of betacarotene than male volunteers at various sampling time. After the administration of betacarotene capsule, peak time was found at 12 hours with mean  $\pm$  SD peak concentration of  $0.353 \pm 0.105$  and  $0.289 \pm 0.236$  micrograms per millilitre in female and male volunteers, respectively. In case of carrot, female volunteers showed mean  $\pm$  SD peak concentration of  $0.385 \pm 0.170$  micrograms per millilitre at 12 hours meanwhile male volunteers showed mean  $\pm$  SD peak concentration of  $0.272 \pm 0.182$  micrograms per millilitre at 4.5 hours. The mean area under the concentration-time curve during 24 hours after betacarotene capsule was  $7.66 \pm 2.12$  micrograms hour per millilitre in female volunteers and  $4.90 \pm 2.46$  micrograms hour per millilitre in male volunteers meanwhile those after carrot was  $8.62 \pm 3.34$  and  $5.44 \pm 2.77$  micrograms hour per millilitre in female and male volunteers, respectively.

On the basis of this investigation, vegetables were recommended to be used as a betacarotene supplement, if needed, rather than betacarotene capsule. Eventhough these two sources have equivalency in betacarotene availability, vegetables contain numerous other components that have a beneficial impact on maintaining health such as fiber, vitamins and nutrients.