Thesis Title DEVELOPMENT OF DATABASE FOR VITAMIN A AND ß-CAROTENE IN THAI FOODS AND ESTABLISHMENT OF SIMPLIFIED DIETARY ASSESSMENT OF RETINOL EQUIVALENT CONSUMPTION

Name Pongtorn Sungpuag

Degree Doctor of Science (Nutrition)

Thesis Supervisory Committee

Sakorn Dhanamitta, M.D., D.Sc. Major Advisor

Kraisid Tontisirin, M.D., Ph.D. Co-advisor

Adrian J. Lamb, Ph.D. Co-advisor

Emorn Udomkesmalee, Ph.D. Co-advisor

Smartachai Santawanpas, Ph.D. Co-advisor

Date of Graduation 24 May B.E. 2536 (1993)

ABSTRACT

A simplified means of dietary assessment to determine vitamin A consumption is needed in order to identify the at risk community. This study aims to do so and was divided into 4 parts, starting from compilation of vitamin A and ß-carotene content in Thai foods according to the pre set criteria. The data were then scrutinized and finalized into the databank and database, respectively. The method to determine ß-carotene in plants by high performance liquid chromatography (HPLC) was developed in the second part. Food

samples were saponified with KOH and extracted with diisopropyl ether before ß-carotene content was determined by HPLC system using VIS detector at 450 nm. The method has a detection limit of 0.8 µg/ml solvent or 0.4 µg/g sample and was used in the third part to analyse ß-carotene concentrations in certain Thai vegetables and fruits. The sample were collected from 5 markets of Ubol Ratchatani province and of Bang Bua Thong District Nonthaburi province. Samples collection covered 3 seasons of the year. High content of ß-carotene (>500 RE/100 g) were found in neem, ivygourd, pak paw, bai ya-nang, bai kra-prao, while medium content (100 - 499 RE/100 g) were detected in chinese swamp cabbage, chinese kale, water mimosa, coriander, yellowish orange sweet potato etc. Ripen mango and papaya showed low to medium content of ß-carotene. The differences in ß-carotene concentration are likely to be caused by seasonal variation, different varieties, type of land for cultivation, and method of analysis.

For the fourth part, the analyzed vegetables and fruits were scored into 3 groups according to their ß-carotene content per serving: 0, 1 (< 50 RE), and 3 (50 - 250 RE). The simplified dietary assessment of retinol equivalent consumption was set up. Vitamin A consumption assessed by this simplified method was compared with those obtained from

the weighing method and twenty-four hour recall of food intake in 3 groups : preschool children, non-pregnant and pregnant women. The statistical analysis (Kappa test) for agreement in the results between those two methods were good (Kappa > 0.46) in the high and low risk of inadequately vitamin A intake but the agreement in the moderate risk category was poor.

The results of this study can be applied to develop other nutrient database, used to screen for community with high risk of inadequate vitamin A intake and follow-up of vitamin A intervention program.