

Thesis Title Effects of dietary fat and β -carotene
 from green leafy vegetable supplementation
 on vitamin A nutrition in preschool
 children
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ABSTRACTS

Vitamin A deficiency is still a basis health problem among children in developing countries mainly due to low fat and vitamin A intakes. It was therefore the objective of this research to determine the effects of green leafy vegetable supplementation at various levels of fat intakes, from 10 - 30 percent of energy in young preschool children. Eighteen apparently healthy subjects aged 13 to 19 months with normal weight for height, were equally divided into three groups and studied for four weeks. Period I of the first 2 weeks provided no supplementation whereas period II of the subsequent two weeks, 30 g ivyghourd was supplemented daily. The subjects received habitual weaning food with adequate protein intake of 1.7 g/kg/d and energy intake of 110 kcal/kg/d from the mixed food consisting of

rice, fish and banana with sweet drink to adjust energy intake. Group I received 10 percent of energy from fat throughout the study whereas fat intake of group II and III were 20 and 30 percent of total energy intake, respectively. Measurement of serum β -carotene, vitamin A, RBP, albumin, hematocrit were done at the beginning of the study, at the end of period I and period II. Balance study during the last three days of each period was conducted for measurement of stool frequency, stool weight, fecal fat and fat absorption. Body weight were recorded daily whereas height, mid-upper arm circumference, tricep skinfold thickness, head and chest circumferences were measured at the beginning and the end of each period.

After the end of period I there were significant decrease in serum β -carotene, vitamin A and total RBP from the initial in all three groups. Group I, the value decreased from 48.7 ± 10.7 to 23.0 ± 6.6 $\mu\text{g/dl}$ for β -carotene ($p < .0005$), 18.8 ± 1.9 to 12.5 ± 2.5 $\mu\text{g/dl}$ for vitamin A ($p < .0005$), 25.7 ± 6.1 to 20.7 ± 4.6 $\mu\text{g/ml}$ for total RBP ($p < .005$). Group II, the values decreased from 44.6 ± 9.6 to 25.4 ± 8.5 $\mu\text{g/dl}$ for β -carotene ($p < .0005$), 19.6 ± 5.5 to 14.1 ± 3.1 $\mu\text{g/dl}$ for vitamin A ($p < .005$) and 32.2 ± 7.9 to 19.6 ± 4.5 $\mu\text{g/ml}$ for total RBP ($p < .0005$). Group III, the values decreased from 47.5 ± 13.9 to 32.8 ± 4.4 $\mu\text{g/dl}$ for β -carotene ($p < .05$), 18.4 ± 3.4 to 13.7 ± 2.8 $\mu\text{g/dl}$ for vitamin A ($p < .005$) and 24.8 ± 12.6 to 15.5 ± 3.4 $\mu\text{g/ml}$ for total RBP ($p < .05$). After green

leafy supplementation in period II, serum β -carotene, vitamin A and total RBP of all groups were significantly increased from at the end of period I. In group I, there were 67.3 ± 13.2 $\mu\text{g}/\text{dl}$ for β -carotene ($p < .0005$), 29.4 ± 3.9 $\mu\text{g}/\text{dl}$ for vitamin A ($p < .005$) and 31.4 ± 5.0 $\mu\text{g}/\text{ml}$ for total RBP ($p < .005$); in group II 89.0 ± 21.1 $\mu\text{g}/\text{dl}$ for β -carotene ($p < .005$), 42.8 ± 9.2 $\mu\text{g}/\text{dl}$ for vitamin A ($p < .005$) and 36.3 ± 4.5 $\mu\text{g}/\text{ml}$ for total RBP ($p < .0005$); in group III 95.9 ± 17.4 $\mu\text{g}/\text{dl}$ for β -carotene ($p < .0005$), 41.4 ± 9.2 $\mu\text{g}/\text{dl}$ for vitamin A ($p < .005$) and 32.6 ± 8.2 $\mu\text{g}/\text{ml}$ for RBP ($p < .005$).

Total RBP showed no significant differences among three groups throughout the study. Serum β -carotene and vitamin A showed no significant differences among three groups at the initial and the end of period I, however there were significant differences between group I to group II and III at the end of period II ($p < .05$). Hematocrit levels showed no significant difference both within group and between groups and serum albumin levels appeared normal for all subjects throughout the study. There was a significant increase in body weight of all groups during two periods.

Stool frequency and stool weight showed no significant differences among three groups in balance period I and II. Group I showed a significant difference in stool weight between balance period I to balance period II ($p < .05$). The fat absorption of all subjects were at quite satisfactory at about 96 to 98 percent of fat intake.

The results from this study suggested that 30 g ivy gourd supplementation daily for two weeks can improve serum β -carotene and vitamin A in young children receiving fat intake even at 10 percent of energy intake. However, dietary fat at 20 percent or more of total energy intake would have greater beneficial effect.