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PANARAT BOONRITTHIKARN : THE EFFECTIVE AMOUNT OF VITAMIN C TO INCREASE IRON AVAILABILITY IN PHYTATE-FIBER FOOD BY *IN VITRO* DIGESTION METHOD. THESIS ADVISORS: NAIYANA BOONTAVEEYUWAT, Ph.D.(Bio.Tech.), DUANGPORN KEAWSIRI, M.P.H.(Food and nutrition planning), WONGDYAN PANDI, Dr.P.H.(Epidemiology) 92 p. ISBN 974-662-553-5

Iron deficiency anemia remains a major problem in Thailand. Most of the dietary iron in diets consists of 80-90% nonheme iron, which is found in rice and vegetables. Nonheme iron absorption depends on the composition of the meal, such as phytate and vitamin C. The objective of this study was to investigate iron availability by the *in vitro* method in experimental diets which contained three levels of phytate: low(<1,200 mg), medium(1,200-1,400 mg) and high (>1,400mg) phytate. The iron availability in diets which contained vitamin C 30, 50, 75, 100 and 125 mg or vitamin C to iron ratio 6:1, 9:1, 14:1, 19:1 and 24:1 respectively were studied. Two types of Thai rice (brown and polished rice) and two types of vegetables (krathin and stringbean) were used as ingredients of the experimental diets. Orange juice containing vitamin C 0.32 mg/cc was used as a source of vitamin C in the present study.

The results showed that phytate and vitamin C had no interaction with the iron availability ($p=0.953$). The iron availability in diets was significantly decreased by phytate ($p<0.001$). The correlation coefficient of phytate and iron availability percentage was -0.813 ($p<0.001$). The iron availability percentage in experimental diets that contained a low phytate level was 1.45 and 1.6 times higher than that in diets with medium and high phytate level. The iron availability in diets was significantly increased by vitamin C ($p=0.007$). The correlation coefficient between vitamin C and the iron availability percentage was 0.655 ($p<0.001$). The iron availability in diets which contained 100 and 125 mg vitamin C (13.6 and 15.4%, respectively) was significantly higher than the diets which contained 30 mg vitamin C (9.99%) ($p<0.05$).

In order to improve iron availability in diets among populations where the traditionally consumed diets have high phytate-fiber contents, the amount of vitamin C in diets should be increased.