

<b>Thesis Title</b>	Functional and Biochemical Responses to Zinc and/or Vitamin A Supplementation in School Children of Northeast Thailand
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### ABSTRACT

Vitamin A deficiency is not a major nutritional problem in Thailand but still exists in a subclinical level especially in young children. Evidences are accumulating that zinc deficiency in Thai children also exists in a marginal stage. Recent surveys in the Northeast region revealed an inadequate intake of both vitamin A and zinc. In addition, biochemical evidence indicated that approximately 25% of the school children in this region had suboptimal zinc and vitamin A status and may benefit from supplementation. Therefore, this study aimed to evaluate the impact of zinc and/or vitamin A supplementation on the biochemical and functional parameters of both nutrients. Since supplementation of vitamin A or zinc had been shown previously to affect iron nutriture, the study also determined certain iron parameters following the intervention trial.

One hundred and thirty-three children, 6-12 years old, with low plasma zinc

(<11.5 $\mu$ mol/L) and vitamin A (<1.05 $\mu$ mol/L) concentrations participated in a double-blind study. They were randomized based on plasma zinc and vitamin A, age and sex to receive supplements containing either zinc (25 mg/d), vitamin A (1500 RE/d), a combination of zinc and vitamin A or placebo every school day for 6 months. Biochemical parameters of vitamin A and zinc status increased significantly following supplementation. Almost all children had adequate vitamin A liver stores. Zinc supplementation resulted in improvement of the time to restore vision in dim light. In addition, vitamin A and zinc synergistically normalized the epithelial tissue of the conjunctiva. Supplementation of zinc and/or vitamin A in this study appeared to have no apparent effect on iron indices (Hct, Hb, ferritin). These results suggested that functional improvement of children with suboptimal zinc and vitamin A status can be accomplished by supplementation with the amount close to those recommended (<2 RDA) in the daily diet.