THE EFFECT OF VITAMIN A-FORTIFIED COOKING OIL INTAKE ON THE SERUM RETINOL LEVEL OF CHILDREN, 4 TO 6 YEARS OLD

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**Background:** Food fortification is one of the strategies to address vitamin A deficiency (VAD) in the Philippines. The fortification technology ensures that 15 g of vitamin A-fortified coconut cooking oil (VAFCCO) when used to cook a meal contributes to 1/3 of the RDA for vitamin A for the Filipino reference man, equivalent to 175 mg retinol. This amount also provides 46.7% of the RDA for the 4 – 6 y old children. Although the fortified product is already out in the market, no effectiveness study has as yet been carried out to document if consumption of the VAFCCO will bring about increased intake of vitamin A and improvement in vitamin A status (VAS) among at-risk target groups. **Objectives:** To determine the effect of VAFCCO intake on children’s VAS and its contribution to the total vitamin A intake, relative to other sources of vitamin A in their current diet; to identify factors that influence their serum retinol levels; and to measure the cost-effectiveness of VAFCCO consumption in improving children’s vitamin A nutriture. **Methods:** A 6-month intervention trial was conducted among 542 children, 4 - 6 y old. Children were randomly assigned to the Experimental group, who received ration of VAFCCO, and to the Control-1 group who received unfortified cooking oil ration. Children in 2 other barangays were assigned to the Control-2 group, without cooking oil ration. Mothers recorded daily children's intake of cooking oil and infections. Serum retinol, anthropometric indicators, and frequency of intake of vitamin A foods were collected around the 50th, 120th and 180th day of the study period. Other variables were also included, i.e., cooking/eating practices, energy, protein and vitamin C intakes. Baseline measurements were taken of all variables, including socio-demographic characteristics and household food expenditure. **Results:** Serum retinol of children in all study groups improved, but relative change from baseline to end of intervention was significantly higher among children with VAFCCO than the Control groups. VAFCCO contributed around 1/3 of total vitamin A at all periods for the Experimental Group while vitamin A-rich foods contributed more than half of total vitamin A intake for both Control Groups. Determinants of post-intervention serum retinol included baseline serum retinol (β=1.21), caregiver's education (β=0.109), receipt of high-dose vitamin A capsule (VAC) (β=1.214), and interaction terms between consumption of VAFCCO and consumption of other vitamin A-rich foods, and between purchase of cooking oil and household food expenditure. Cooking oil fortification which cost P1.89 per day to improve status of a vitamin A-deficient child was more cost-effective than high-dose VAC at P11.58 per day and use of unfortified cooking oil at P2.37 per day. **Conclusion:** Intake of VAFCCO combined with intake of vitamin A-rich foods such as green leafy and yellow vegetables, liver, fish, meat and eggs, rather than VAFCCO alone, is
necessary to increase serum retinol in children, 4 – 6 y old. It is recommended to promote the use and consumption of VAFCCO together with other rich sources of vitamin A to sustain the prevention and control of VAD, and to pursue high-dose VAC in areas at high-risk of VAD. Fortification of coconut oil with vitamin A is value-adding that translates to: improved VAS at a minimal cost; increased product demand, production and employment opportunities among coconut farmers; and the improvement of the economic as well as the nutritional conditions of small-scale coconut farmers and their households.

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