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Red palm olein-enriched biscuit supplementation lowers *Ascaris lumbricoides* reinfection at 6-month after anthelmintic treatment among schoolchildren with vitamin A deficiency (VAD)

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Abstract

Notwithstanding the global efforts made to control intestinal parasitic infections, soil transmitted helminth (STH) infections are still one of the most prevalent infections globally, especially in developing countries. A double-blinded, randomized controlled trial was conducted on 343 primary schoolchildren (8-12 years old) with vitamin A deficiency (VAD) in rural areas of Malaysia to investigate the effects of red palm olein (RPO)-enriched biscuits on STH reinfection rates and infection intensities. The effects of the RPO-enriched biscuits (experimental group, n = 153) and palm olein (PO)-enriched biscuits (control group, n = 190), were assessed at 3- and 6-month after the administration of complete triple-dose albendazole (one dose of 400 mg for three consecutive days). The overall STH infection rate at baseline was recorded at 65.6%. At 6-month, a significantly lower reinfection rate of *A. lumbricoides* was observed in the experimental group (35.3%) compared to the control group (60.0%) ($P < 0.05$), and a significant reduction in fecal egg count (epg) of *A. lumbricoides* was observed in the experimental group from baseline ($P < 0.001$), but no significant reduction was observed in the control group. No significant differences in the reduction of infection intensities of *T. trichiura* and hookworm were observed between experimental and control groups at 3- and 6-month ($P > 0.05$). These findings suggest the potential beneficial effects of RPO-enriched biscuit supplementation on the reinfection of *A. lumbricoides*, which could be attributed to its high carotenoids content by enhancing host immune response and mucosal epithelium integrity. However, further studies are warranted to confirm whether RPO supplementation could result in similar parasite-specific beneficial effects in other community settings, as well as to explore the underlying mechanisms.

Keywords: Randomized controlled trial; Red palm olein; Reinfection; Soil-transmitted helminth; Vitamin A deficiency.

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