

IAEA-CN-217--5P

Effects of Animal-Source Foods and Micronutrient-Fortification Complementary Foods on Body Composition, Linear Growth, Iron Status – the WinFood Project in Cambodia

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Keywords: Complementary foods (CF); Body composition (BC); Animal-source foods (ASF)

Background and objective: The nutritional quality of CF in developing countries is often insufficient to sustain optimal growth. The Winfood project evaluated the efficacy of two new, processed rice-fish based CF with local ASF in Cambodia: non-fortified 'WinFood' (WF) with 14% by dry-weight ASF from small-sized fish (*Esomus longimanus* and *Paralabuca typus*) and edible spiders (*Haplopelma* sp.); an adjusted 'lite' WinFood (WF-L) with 10% by dry-weight ASF from small-sized fish of mixed species, and fortified with minerals and vitamins. The products were precooked by extrusion. The WF-products were compared with two standard products from World Food Programme: Corn-Soy-Blend (CSB+) and CSB++ (8% by dry-weight skimmed-milk powder), in a single-blinded randomized trial.

Methods: 419 Cambodian infants at age 6 months were randomized to daily rations of one of the four products for nine months period. BC (deuterium dilution) and iron status (serum ferritin and hemoglobin) were measured before and after intervention; and anthropometry (knee-heel-length, length, weight, MUAC, head circumference and skinfolds) monthly. Data were analyzed by intention-to-treat.

Results: Among 358 children completing the study, no significant difference in BC between the groups were found, but knee-heel length increments differed ($P=0.046$: WF-L: 3.6 cm, CSB++: 3.6 cm, WF: 3.5 cm, CSB+: 3.4 cm), suggesting that micronutrient-fortified products with 8-10% ASF (CSB++ and WF-L) promoted better linear growth than products without fortification or ASF. Knee-heel and total length increment was significantly higher in the highest food compliance quartile compared to the lowest, across food groups. There were no differences in ferritin and hemoglobin concentration. There was higher prevalence of anemic children in the WF group.

Conclusion: Products with ASF (milk or small fish) and micronutrient premix resulted in slightly better linear growth. Small fish is a cheap ASF with high potential to improve locally produced industrially processed CF.