IRON STATUS AND PHYSICAL GROWTH OF SCHOOLCHILDREN, 6-9 YEARS OLD, AFTER CONSUMPTION OF MULTI-MICRONUTRIENT-FORTIFIED MILK AND BISCUITS

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Background: The 6th National Nutrition Survey 2003 revealed that the prevalence rate of underweight (25.6%), anemia (37.4%), and vitamin A deficiency (40%) among children, aged 6 to 12 years, are high. Chronic undernutrition leads to poor physical and mental performance among children, making urgent putting in place strategies to control their rising prevalence. Fortifying foods and consuming them offers a great opportunity to increase energy and nutrient intakes. Objective: To determine the effects of fortified milk and biscuits on the iron status and physical growth of schoolchildren 6-9 years old. Methods: The list of elementary schools with and without any previous supplementary feeding program was obtained from the DepED District, Pili, Camarines Sur. Three schools were randomly selected from the schools with previous supplementary feeding (San Jose, Libmanan, and Sol Marasigan) and another 2 schools from those without previous feeding program (Bacagay and Tinambac). The children from the first three above mentioned schools were allocated to the fortified-fed group (Group 1), those in Bagacay to the unfortified-fed group (Group 2), while those in Tinambac served as the Control (Group 3). A total of 667 children, aged 6-9 years, were screened for hemoglobin (Hb) and weight. Complete data sets were obtained from 630 children. For each group, children who were either anemic, underweight, anemic-underweight, or normal were randomly selected. All children received deworming drugs 3 days before the intervention. Milk (200 mL) and 30g biscuits were given 5 days a week for 115 days under strict supervision. The fortified milk contained vitamin A while the biscuits contained iron, and zinc. Hb, plasma ferritin, and weight were measured at baseline and endline. All empty tetra packs and biscuit wrappers were retrieved daily. Results: Anemia rates among the anemic children were significantly reduced from a basal rate of 100% to 40.8% (fortified-fed), 46.7% (unfortified-fed), and 26.2% (control) endline. Among the underweight-anemic, anemia rates dropped from 100% to 37.1% (fortified-fed), 69.2% (unfortified-fed), and 52.3% (control). Among the underweight children, anemia rates observed at endline were: 10.5% (fortified-fed), 17.5% (fortified-fed), 10.5% (Unfortified-fed) and 2.6% (control). Plasma ferritin levels among the anemic and underweight-anemic children who received the fortified milk and biscuits were higher than those of their counterparts in the unfortified-fed and control groups at endline. Prevalence of underweight among underweight-anemic children were
significantly reduced from 100% to 65.7% (fortified-fed), 76.9% (unfortified-fed), and 97.7% (control) at endline. Among underweight children the prevalence dropped to: 54.4% (fortified-fed), 47.8% (unfortified-fed), and 89.5% (control). Among the anemic children, underweight was only found in the unfortified-fed (2.2%) and control (4.2%). Among the normal children, underweight was also found in the unfortified-fed (1.3%) and control (6.4%)  

**Conclusion:** Multi-micronutrient-fortified milk and biscuits were effective in reducing anemia prevalence among iron-deplete children. Underweight was effectively reduced among children consuming the fortified milk and biscuits. The multi-micronutrients in milk and biscuits maintained the normal basal weights of children at endline. **Recommendation:** It is recommended that the provision of multi-micronutrient-fortified-foods like milk and biscuits be included in the supplementary feeding programs in schools to improve the nutritional and iron status of children.