



A Food-Based Approach Introducing Orange-Fleshed Sweet Potatoes Increased Vitamin A Intake and Serum Retinol Concentrations in Young Children in Mozambique

Jan W. Low, Mary Arimond, Nadia Osman, Benedito Cunguara, Filipe Zano, and David Tschirley

Vitamin A deficiency (VAD) is pervasive among young children; more than 125 million are estimated to suffer from VAD worldwide. In Mozambique, the prevalence among children ages 6 months to 5 years is estimated at over 70 percent. In such circumstances, food-based approaches may be appropriate and sustainable complements to supplementation and fortification programs. Orange-fleshed sweet potato (OFSP) is a strong candidate for this, as some varieties are very rich in beta-carotene, the precursor to vitamin A in plant sources. It is also well accepted by young children, a good source of energy, easy to cultivate, propagated vegetatively and fairly drought resistant once established. These characteristics make it an excellent food security crop.

The effectiveness of introducing OFSP was assessed in a two-year integrated agriculture and nutrition intervention in 741 households in Mozambique. The aim was to increase vitamin A intake and serum retinol concentrations in young children. The study was quasi-experimental, prospective, controlled, and longitudinal.

The intervention was undertaken in three drought-prone districts with high levels of young-child malnutrition, a monotonous diet with cassava as the primary staple, and a very poor resource base. To increase production of OFSP and vitamin A intake, the project aimed to simultaneously increase farmers' access to OFSP vines, increase nutrition knowledge and create demand for OFSP, and ensure sustainability through market development. A wide variety of activities were undertaken, including community theater, radio spots, presence at local markets, and integrated farmer and nutrition extension.

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Agricultural extension covered topics including production methods, storage, and commercialization of OFSP. Nutrition extension activities included lectures using visual aids and a variety of interactive methods to convey messages regarding infant and young child feeding and hygiene

practices. Participants had the opportunity to attend 9–12 sessions over a one-year period. Nine surveys were taken over the two years, gathering data on socioeconomic and demographic characteristics of the households and dietary intake of the children. Data gathered included how many days in the last week the child had eaten OFSP and other vitamin A-rich foods and fat sources. The data gathering was repeated to capture

seasonal variation and change over the two years. Blood samples were collected from all study children for biochemical analysis. Finally, sweetpotato plots were measured annually and market prices of major sources of vitamin A were monitored.

At the end of two years, five of the nine

introduced varieties of OFSP were well accepted by farmers in terms of taste and agronomic performance, and plot size increased over 10-fold, from an average of 33 m² to over 350 m². Caregivers in intervention households attended an average of eight nutrition education sessions; their knowledge of nutrition and vitamin A also increased relative to baseline and relative to caregivers in control areas. Between-group differences in knowledge were also reflected in differences in several child feeding practices. . Intervention children were ten times more likely than control children to eat OFSP three or more days during the previous week, their vitamin A intakes were much higher than those of control children, with the OFSP providing about 35 percent of vitamin A intake among intervention children (and 90% for the individual children who ate OFSP on the recall day). Controlling for confounding factors, mean serum retinol increased in intervention children but did not increase significantly in control subjects. This study demonstrates the high potential public health importance of an integrated agriculture-nutrition intervention. Prevalence of low serum retinol

concentrations remained the same in control areas and dropped from 60 to 38 percent among intervention children. In control areas, the final estimate of prevalence was nearly identical to baseline despite the fact that all children had access to vitamin A supplements. In this and similar contexts, food-based interventions may be most needed as complements to capsule distribution. For intervention children, the reduction in prevalence was substantial, but the final round prevalence of nearly 40 percent highlights the need for multiple strategies. This should underscore the importance of numerous efforts currently underway. Driven in part by the impact of HIV/AIDS, less labor-intensive crops with flexible planting and harvest times are being integrated into efforts to diversify diets and improve household food security. Food-based approaches using OFSP clearly have potential to increase young child intakes and serum retinol concentrations in areas where baseline prevalence of deficiency is high and where any type of sweet potato has previously been cultivated. There is potential for broad impact, because sweet potato is produced in many parts of Sub-Saharan Africa.

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