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Assessing the Nutritional Outcomes of Adopting Biofortified Crops

A Comparative Analysis of Orange-Fleshed Sweet Potato in Tanzania's Lake Zone Households

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ABSTRACT

{ "background": "Biofortification is a key strategy to combat micronutrient deficiencies in sub-Saharan Africa. Orange-fleshed sweet potato (OFSP), rich in vitamin A, has been promoted in the region, but evidence of its nutritional impact at the household level, particularly in the Lake Zone, remains fragmented.", "purpose and objectives": "This study compares the nutritional status of children under five in households that have adopted OFSP with those in non-adopting households. It specifically analyses differences in dietary diversity and vitamin A intake.", "methodology": "A cross-sectional comparative design was employed. A multi-stage sampling procedure selected 400 households (200 adopters, 200 non-adopters) across three regions. Data were collected via structured questionnaires, 24-hour dietary recalls, and anthropometric measurements. Analysis involved multivariate regression and propensity score matching to control for confounding factors.", "findings": "Children in OFSP-adopting households had a significantly higher mean dietary diversity score (4.7 vs. 3.2) and were 40% more likely to meet their minimum dietary diversity requirements. A key theme from qualitative data was that women's control over OFSP cultivation decisions strongly correlated with its frequent inclusion in child meals.", "conclusion": "Adoption of OFSP is associated with improved dietary quality for young children in the study area. The findings underscore the role of biofortified crops in enhancing household nutrition when integrated into local agricultural systems.", "recommendations": "Nutrition-sensitive agriculture programmes should prioritise support for women smallholders as adopters and decision-makers. Extension services need to couple agronomic training with behaviour change communication focusing on infant and

young child feeding practices.", "key words": "biofortification, vitamin A deficiency, dietary diversity, smallholder agriculture, child nutrition, Tanzania", "contribution statement": "This paper provides novel empirical evidence on the causal pathway between OFSP adoption and child nutrition by employing a robust quasi-experimental design to isolate the crop's specific effect within a complex food

Keywords: *Biofortification, nutritional security, adoption studies, sub-Saharan Africa, orange-fleshed sweet potato, comparative analysis, micronutrient deficiency*

Article Highlights

- OFSP-adopting households showed significantly higher child dietary diversity scores (4.7 vs. 3.2).
- Women's control over cultivation decisions correlated strongly with OFSP inclusion in child meals.
- Propensity score matching isolated the crop's specific nutritional effect from confounding factors.
- Findings support biofortification as a viable strategy within local agricultural systems.

Methodological Note

The study employed a quasi-experimental design with 400 households and used propensity score matching to establish causal inference between adoption and nutritional outcomes.

This analysis provides robust evidence for nutrition-sensitive agricultural policy.

ABSTRACT-ONLY PUBLICATION

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