



Use of Orange Fleshed Sweetpotato (OFSP) to Combat Vitamin A Deficiency in Sub-Saharan Africa Through Innovative Delivery Systems

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What is the problem?



- Vitamin A deficiency (VAD) contributes to significant rates of blindness, disease, and premature death in Sub-Saharan Africa (SSA).
- Young children and pregnant or lactating women are particularly at risk of VAD
- VAD can have multiple causes.
 - It can result from inadequate intake due to a lack of vitamin A sources in the diet or
 - From insufficient vitamin A absorption because of the presence of parasites or infectious diseases.

Food-Based Interventions



- Food-based interventions (animal & plant sources) enhance micronutrient intake through improvements in diet
- Take longer to put in place than supplements
- Their potential long-term sustainability is high under appropriate agro-ecologies
- Complement fortification and supplementation

Strong evidence that OFSP can impact on vitamin A status exists (2003-2006)



Research in South Africa (efficacy) (van jaarsveld et al. 2005) and Mozambique (effectiveness) has proven that the beta-carotene in orange-fleshed sweetpotato (OFSP) is bioavailable and can improve vitamin A status in the SSA context



**Feeding Trial
In South Africa**



**Community-Level Integrated
Intervention in Mozambique**

125 grams of most OFSP varieties can supply the recommended daily allowance of vitamin A for children and non-lactating women

Reaching End Users (REU) 2007-2009

Mozambique
14,000 hhs

Impact

Control

Model 2

Implementation

Model 1

Control

Model 2

Implementation

Model 1

**Operations
Research**

Uganda
10,000 hhs

1. Training,
2. Community
3. Radio
4. Field and
community
training

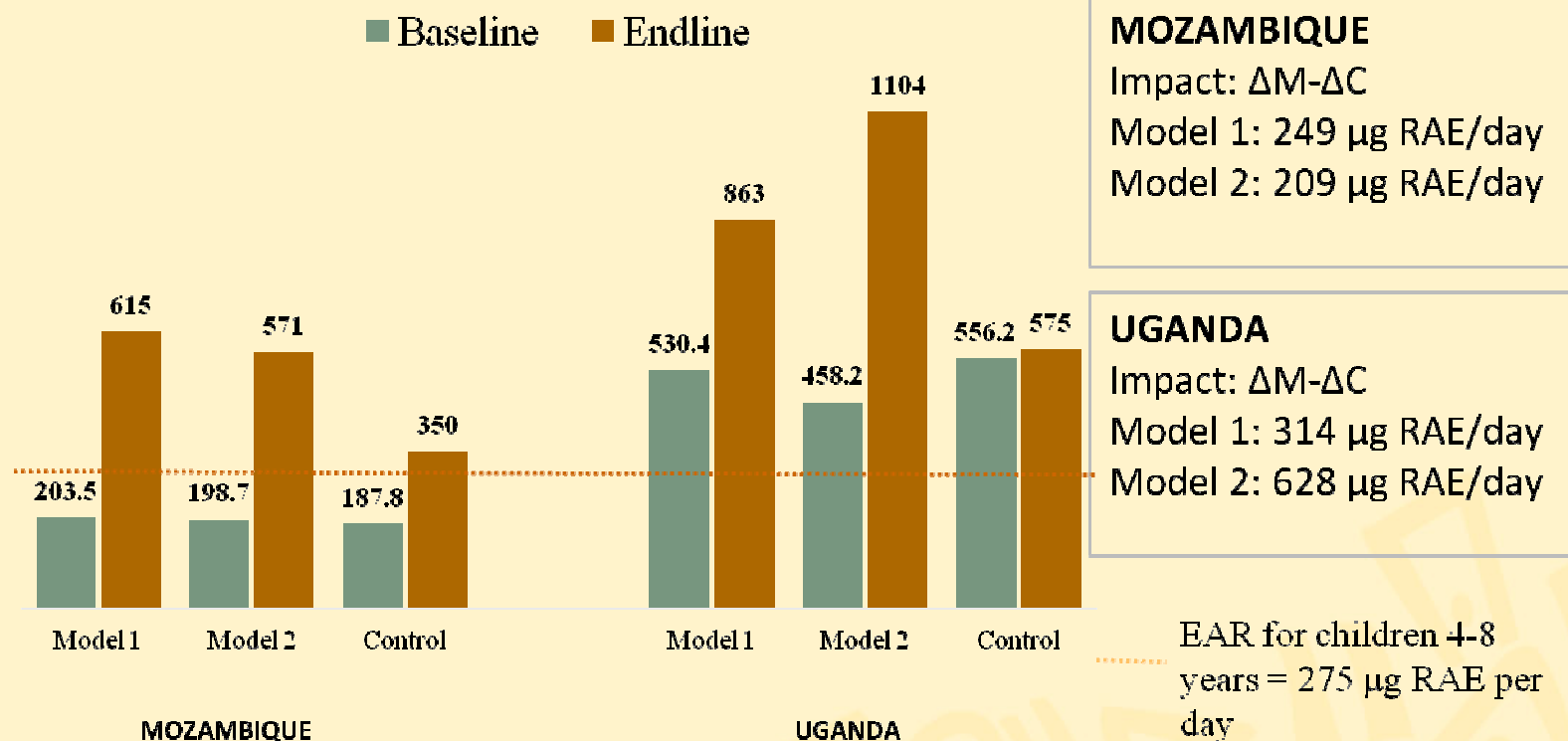


High adoption rates (>60%) & positive outcomes on vitamin A intake among children and their mothers



(intent to treat figures, include non-adopters)
(Impact Study led by IFPRI)

**CHILDREN 3.5–6 YEARS (MOZAMBIQUE) AND
5–7 YEARS (UGANDA) AT ENDLINE**



Estimated Average Requirements (EAR): satisfy 50% of needs of age group

Key Findings: Vitamin A Intakes



There were no differences in vitamin A intakes between Model 1 and Model 2 groups

In both countries, the change in vitamin A intakes in the intervention groups was accounted for by the increased intake of vitamin A from OFSP.

- Mozambique: OFSP = 71-84% of total Vit A
- Uganda: OFSP = 44-60% of total Vit A



**17 priority
countries,
3 sub-regions**

**Under
SASHA,
activities in
8 countries**

Delivery strategies



- Mama SASHA in Western Kenya
- Sweetpotato Super foods in Rwanda
- Marando Bora in Tanzania
- Rooting out Hunger through OFSP in Malawi
- OFSP in Mozambique, Angola and Ethiopia

Mama SASHA in Western Kenya



The overall goal is to *assess the cost effectiveness of integrating OFSP into an existing health service delivery program to improve the health status of pregnant women and the nutritional status of children up to two years in selected districts of Western Kenya*

Effective Delivery Systems to improve Vitamin A Intakes Mama SASHA in Western Kenya



- Can linking orange-fleshed sweetpotato (OFSP) access and nutritional training to existing health services provide:
 - an incentive to pregnant women to increase health service utilization?
 - lead to increases in consumption of OFSP and other vitamin A rich foods by the women and their young infants?
- Project in Western Kenya: 1st in SSA linking ag to health
- Partners: PATH (International health NGO), CREADIS & ARDAP (two local agricultural NGOs), Ministry of Health, Ministry of Agriculture and CIP

Mama SASHA Pilot Phase Results



- **Linking OFSP to Health Services for Pregnant Women**
- **Operations research at end of 1 year pilot led to several protocol adjustments**
- **Successfully Conducted Baseline Survey**
 - 968 pregnant women
 - 1,918 mother-child (6-24 month old) pairs
- **Full implementation began April 2011**
 - As of June 16th: 1,296 vouchers issued
 - 798 redeemed (62%).



Marando Bora “Better Vines” in the Lake Zone of Tanzania



- Aim is for better and timely access to quality sweetpotato planting vines
- Need to sensitize on yield benefits of "clean" material
- In all the projects we are testing the use of Decentralized Vine Multiplication (DVM) and vouchers piloted in Mozambique
- In this project, we are comparing DVM approach to mass multiplication.



Marando Bora First year highlights (Better vines for Bigger harvests)



Building on year one's achievement of mass in-vitro multiplication and hardening of over 35,000 tissue culture plantlets, we have completed the first round of dissemination to over 10,000 households and have learned much to help plan for a massive dissemination in the September-November 2011 season

We are using Decentralized Vine Multipliers and Mass distribution strategies to reach 150,000 households in the current planting season to end of May, 2012



Rwanda Super Foods Value Chain Project

Processing of OFSP based products offers the opportunity to increase demand for the crop, create value added, and thereby expand the incomes of smallholder producers and improve access to Vitamin A rich product

The Challenge: Sweetpotato is bulky to transport and out-of-ground storage in SSA not widely practiced. Sweetpotato flour not economically viable at current prices; puree makes good products but building sustainable supply chains is the challenge.

Building a private-public sector partnership in Rwanda:

SINA enterprises, Rwanda Agricultural Board (RAB), KIST(University), CRS

Sweetpotato puree makes superior products and more economically viable products than sweetpotato flour. Need to improve handling and storage issues related to puree



Objective 1: Multiply and deliver appropriate clean planting materials to farmers



Plantlets hardening



In-vitro plantlets multiplication at Rubona lab (RAB)



Transfer of plantlets to the field



Field multiplication of clean vines



Objective 2

Develop a sweet potato value chain based on farmer group formation, delivering roots & semi-processed products to various processors as a substitute for wheat flour in their bakery line



Kotemu cooperative with Regina Kapinga (BMGF)
(Above photo)



Kundumurimo cooperative in their newly planted field
(Lower photo)

Processing technology development & dissemination to partner processors



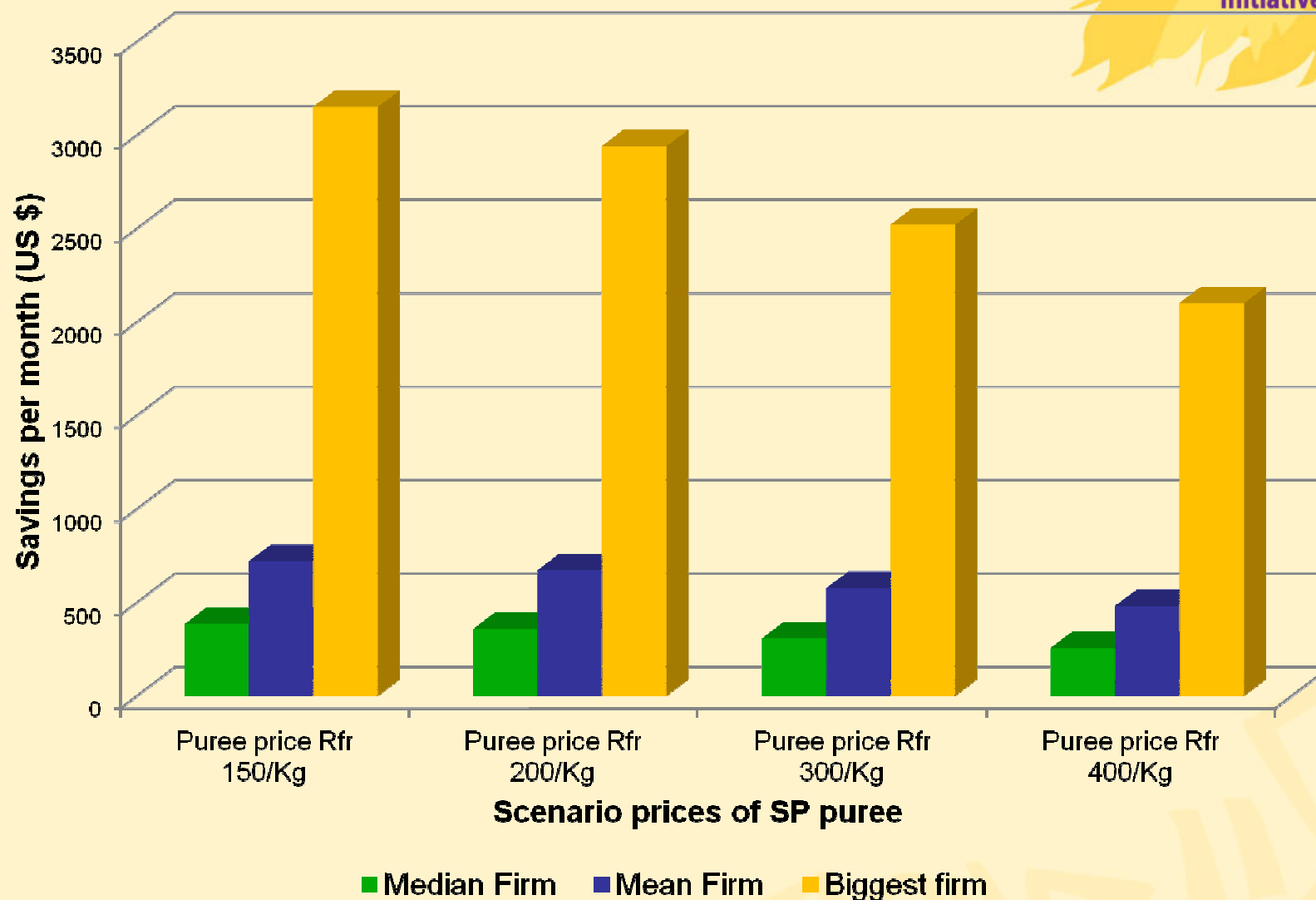
Making of sweet potato puree



Team having sensory test of products at Urwibutso factory at Nyirangarama, Rwanda



Scenario analysis of projected savings if surveyed firms in Rwanda incorporated SP in their products



Other Programs



*Rooting Out Hunger
in Malawi (Irish Aid)*



OFSP in
Angola
(Chevron)



OFSP in Ethiopia
(USAID & ASARECA)

Breaking the Seed System Bottleneck



Storing roots

After 4 years of research, we have successfully Improved on an existing practice to help farmers in areas with a prolonged dry season access vines at the beginning of the rains.

The Triple S System



Sprouted roots planted out to produce vines





PRELIMINARY RESULTS FROM BASELINE SURVEYS

Baseline data strategy

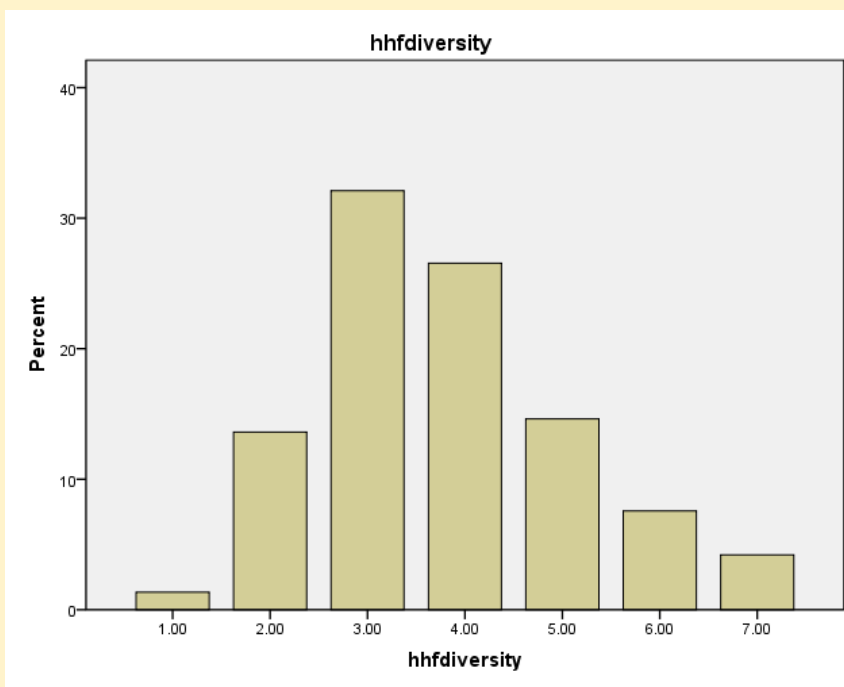


- We had standardized data collected from all the areas of intervention
 - Previous day consumption of major food groups (dietary diversity index)
 - Total number of groups: 7
 - WHO definition: minimum of 4 groups
 - HKI semi-quantitative method for frequency of consumption of vitamin A rich foods during past 7 days
 - Knowledge of Vitamin A for Men and Women
 - Other social economics indicators

24 hour recall of food groups consumption in Tanzania Lake Region

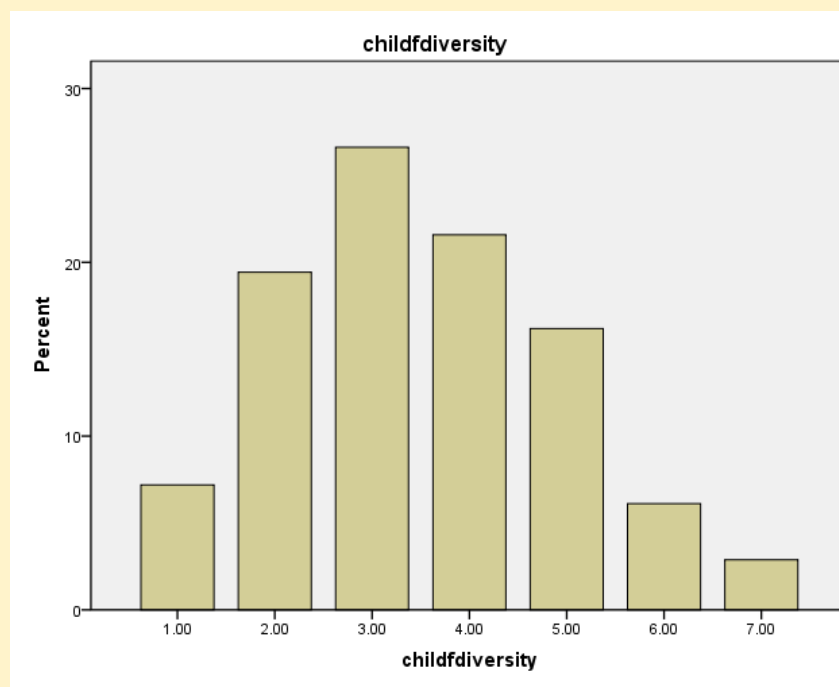


Household food diversity (N=595)



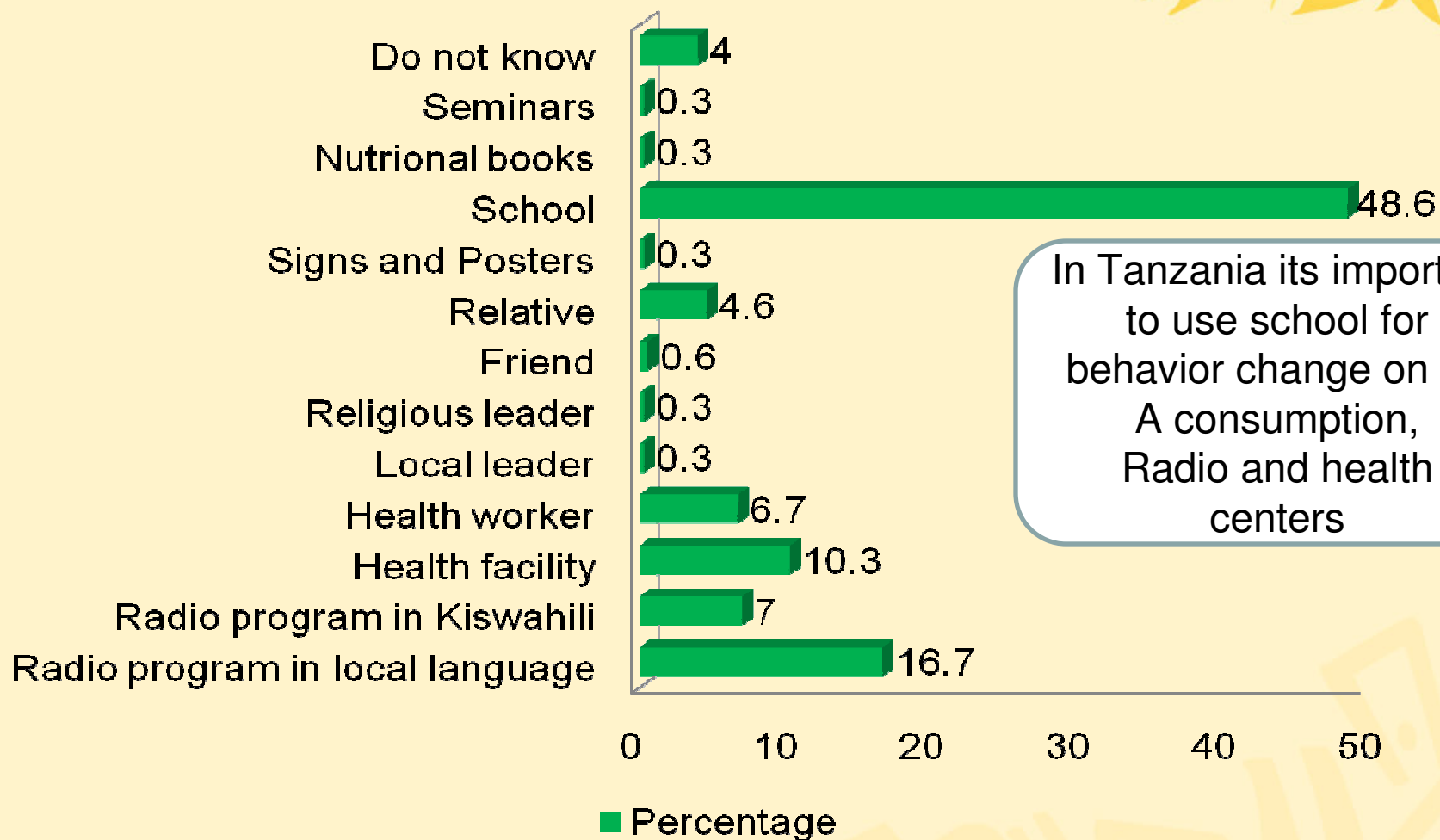
47% of the households do not meet the minimum dietary diversity as per WHO 4 food groups recommendation

Child food diversity (N=278)



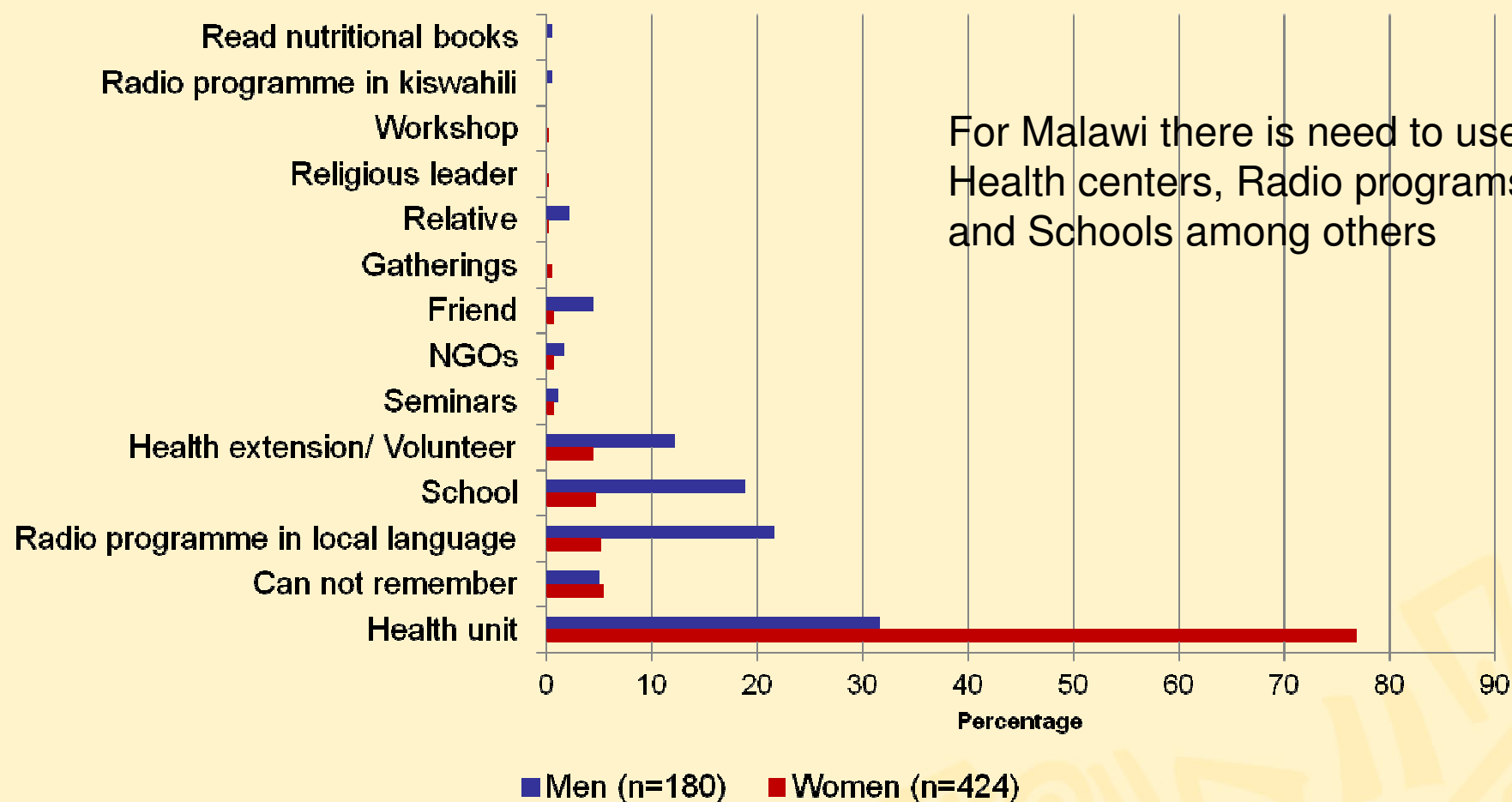
53% of the children do not meet the minimum dietary diversity as per WHO 4 food groups recommendation

Sources of Vit. A information in Tanzania Lake Region



In Tanzania its important
to use school for
behavior change on Vit
A consumption,
Radio and health
centers

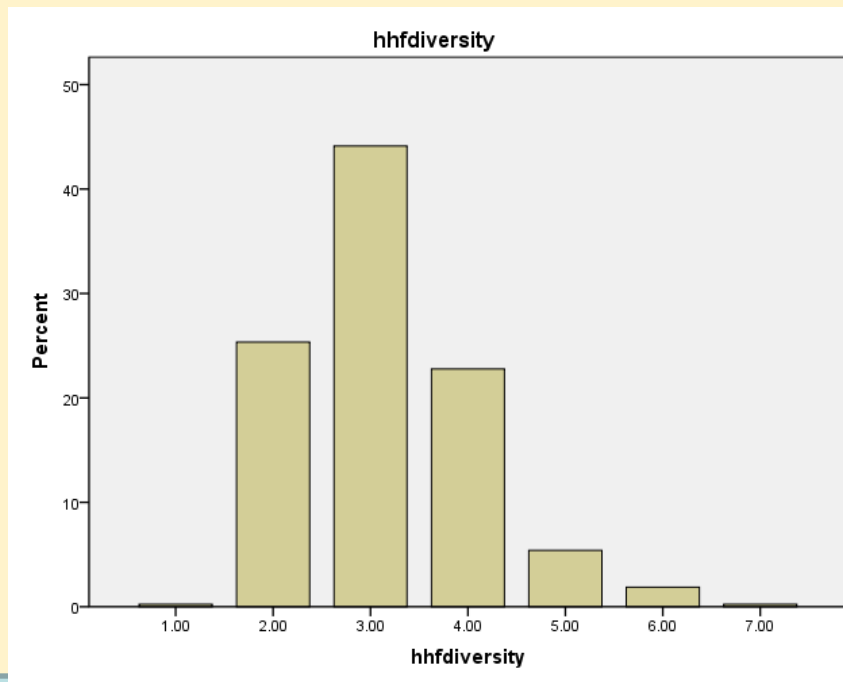
Sources of Vitamin A knowledge in Malawi



24 hour recall of food consumption in Malawi

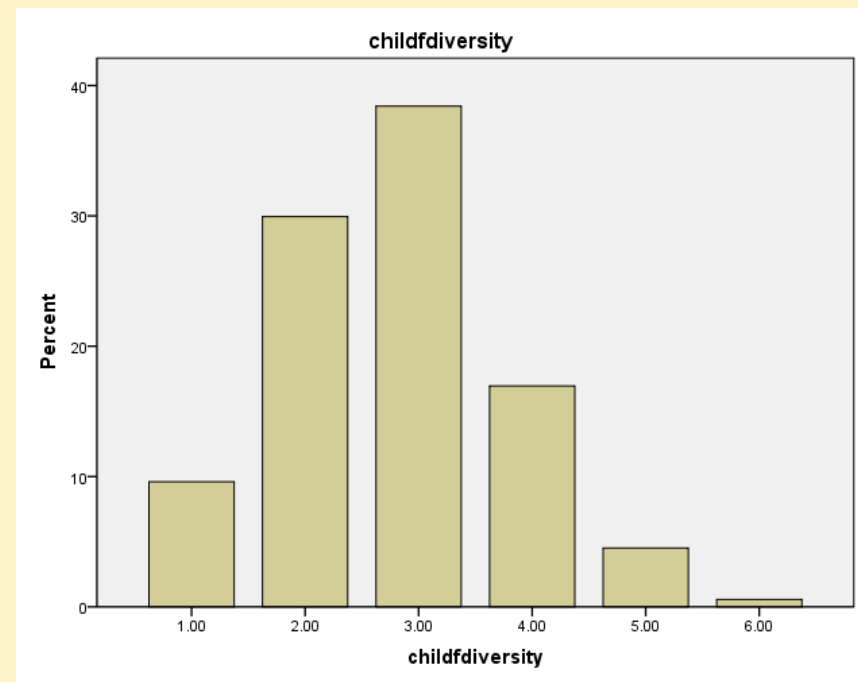


HH food diversity score (N=426)



70% of the households do not meet the minimum dietary diversity as per WHO 4 food groups recommendation

Children food diversity score (N=177)

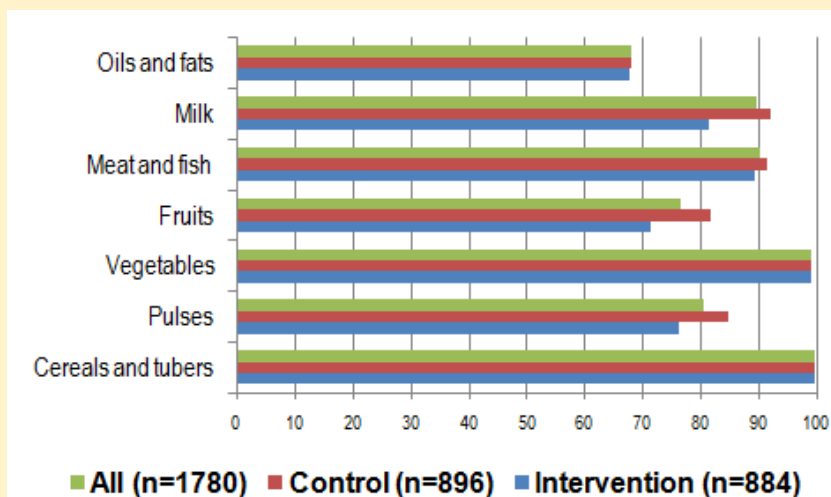


78% of the children do not meet the minimum dietary diversity as per WHO 4 food groups recommendation

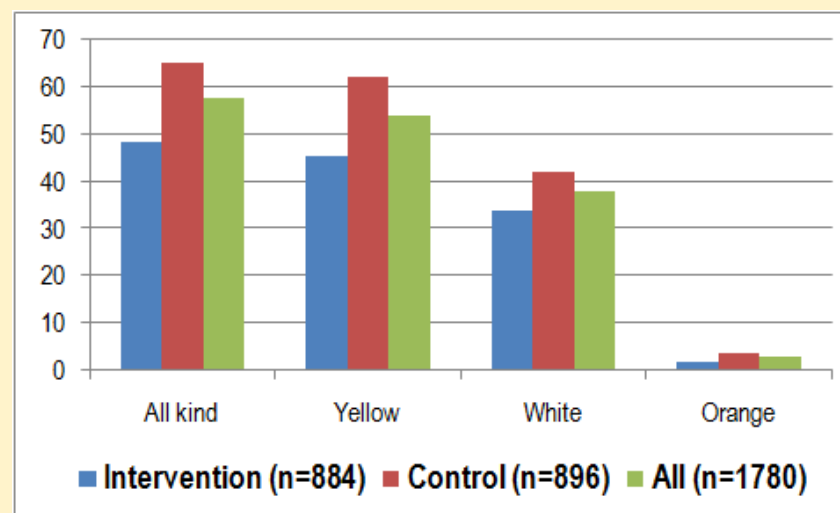
Food groups and OFSP consumption in Kenya



% of HH consumed item in the past 7 days



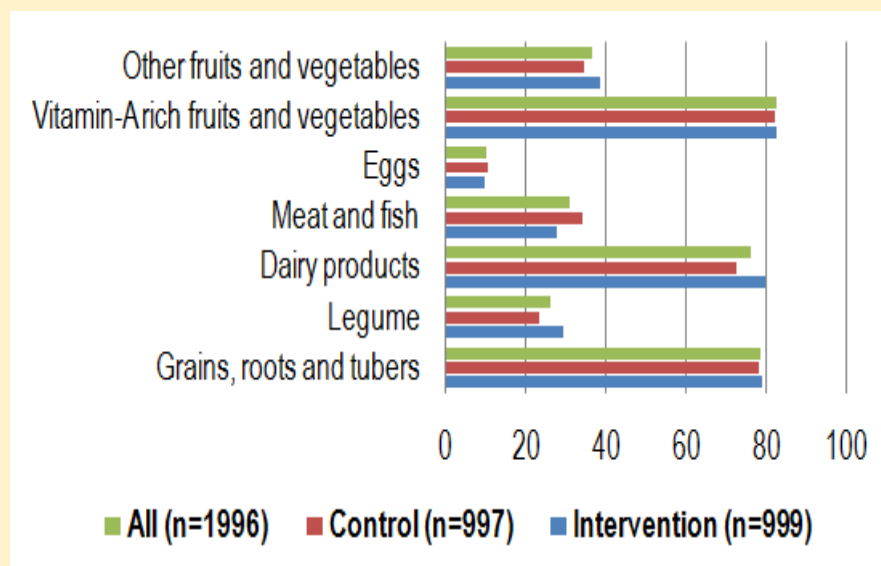
% HH that consumed SP in the past 7 days



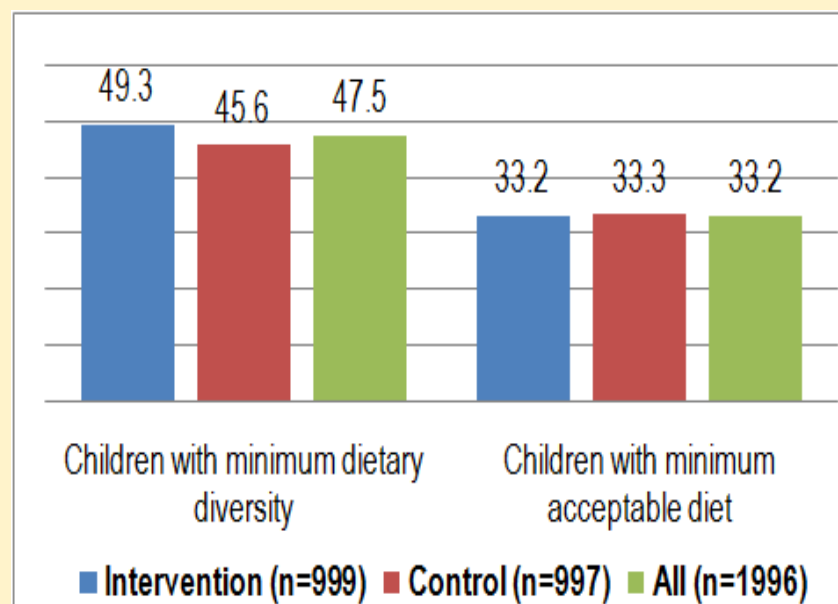
24 hour recall of consumption of various food groups



% of children who consumed various food groups



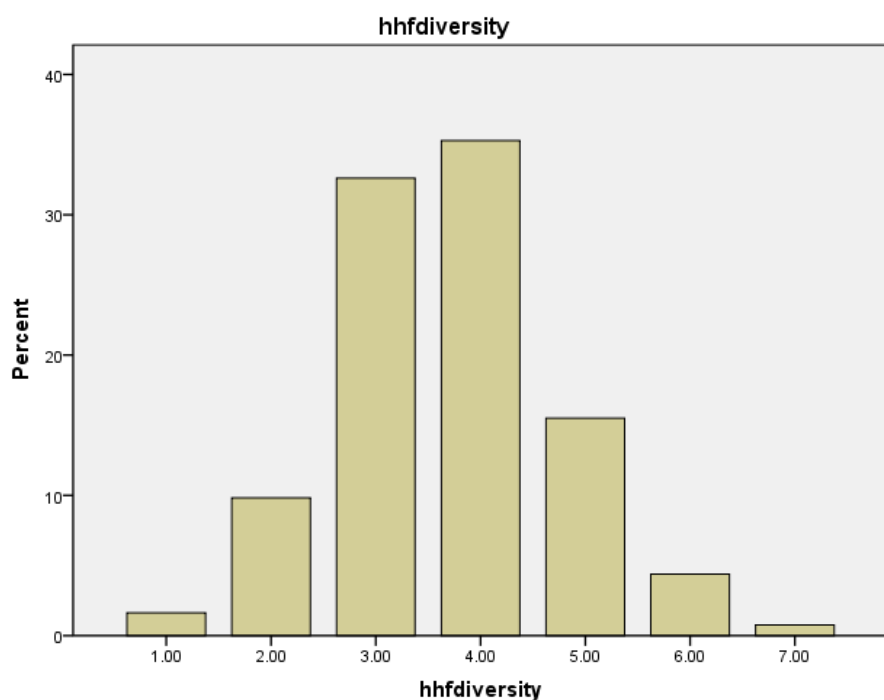
Distribution of children according to dietary practices



24 hour recall of food groups consumption in Western Kenya Region

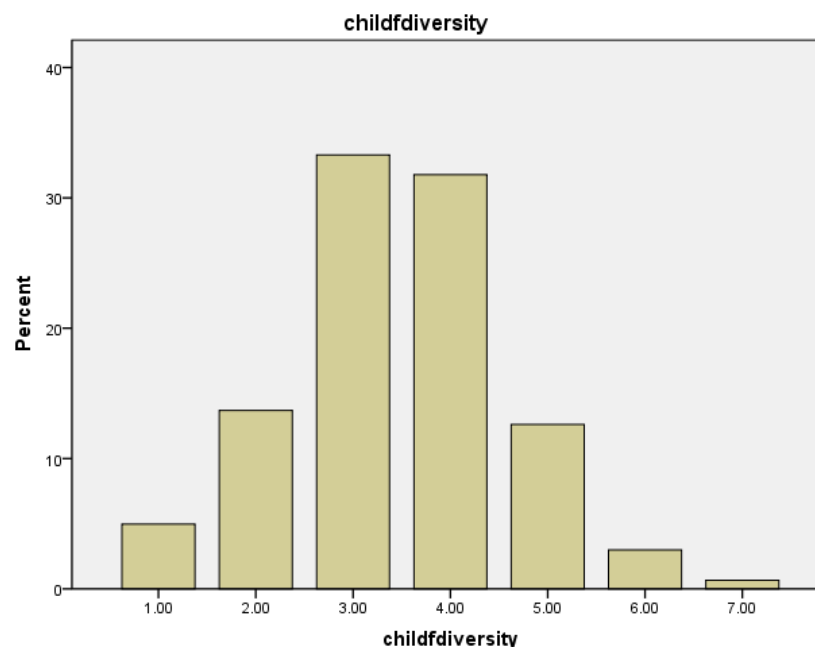


HH food diversity score (N=2760)



44% of the households do not meet the minimum dietary diversity as per WHO 4 food groups recommendation

Children food diversity score (N=1973)



52% of the children do not meet the minimum dietary diversity as per WHO 4 food groups recommendation

Nutritional Status of Children at Baseline



Prevalence of wasting, underweight and stunting

Status	Intervention (%)	Control (%)	All (%)
Wasting	7.0 (n=986)	4.9 (n=983)	5.9 (n=1669)
Underweight	16.1 (n=988)	12.4 (n=976)	14.3 (n=1964)
Stunting	27.3 (n=984)	28.2 (n=972)	25.1 (n=1956)

Conclusions



- We can go to scale with an integrated approach (nutrition-agriculture) as shown by REU results
- We are still learning about DVMs to improve more sustained access to quality planting materials
- Use of Triple S method will improve vine conservation in drier areas
- We have to add value to fresh roots to increase the uptake and incomes









New SPHI Associated Programs



Advocacy



Capacity
Strengthening

Reaching Agents of Change (Bill & Melinda Gates Foundation):
Mozambique, Tanzania, Nigeria, Ghana & Burkina Faso



May the Passion continue