The OFSP Story: Key Lessons & Discussion for Ag-Nutrition Programming

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Ag2Nut Community of Practice Webinar
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Outline

- Phases in OFSP Development
  - Jan Low
- Focus on testing of ag-nutrition-health model: “Mama SASHA”
  - Aimee Webb Girard
- Scaling up building on integrating ag-nutrition experience
  - Robert Ackatiah-Armah
- Discussion
Orange-fleshed Sweetpotato (OFSP): The Model for Biofortified Crops with a Visible Trait

- Higher yielding
- Rich in Beta-Carotene
- Earlier maturing

- All types good sources of vitamins C, K, E and several B
- Most varieties in SSA white-fleshed: no beta-carotene
- 100 gms (one small root) meets daily vitamin A needs of a young child
Phases of Development and Promotion Linked to Evolving Policy Environments in Agriculture and Nutrition

- Phase 1: Recognition of the Potential (1991-2000)
- Phase 2: Building the Evidence Base (2001-2009)
- Phase 3: Going-to-Scale & More Evidence (2010-2017)

From left to right: Jan Low, Robert Mwanga, Maria Andrade, Howdy Bouis

*Low et al., Global Food Security, 2017,*
https://doi.org/10.1016/j.gfs.2017.01.004
Phase 1: Pilot Work with 20 Women’s Groups in Western Kenya:

- Easy to incorporate OFSP-based weaning foods into young child diet & improve feeding frequency
- Nutrition education component essential
- Preferences differed
  - Children: low dry matter
  - Adults: high dry matter


Hagenimana et al., ICRW /OMNI Research Report No. 3, 1999
Phase 1: Actual Breeding Only Taking Place in Uganda & South Africa. Emphasis on Selecting Best Bets from Imported Varieties

Robert Mwanga (2nd from right) with East & Central African breeders in 1994

Top row: Maria Andrade (2nd left) & Jan Low (3rd left) at 1st Multi-sectoral Meeting in 1999

1997-1999
1st generation adaptation trials (68 clones)

April 1999
1st strategy to combat micronutrient deficiencies
INTEGRATED CONCEPTUAL FRAMEWORK

#1 Access to Beta-Carotene-Rich Sweetpotato Vines
- Substitute white-fleshed with orange fleshed, beta-carotene rich varieties
- Improved agronomic & storage practices to assure availability
- Produce more Energy & Beta-Carotene per hectare

#2 Demand Creation & Empowerment Through Knowledge
- BEHAVIORAL CHANGE: Work with caregivers to improve feeding practices
- Increase Young Child Feeding Frequency & Diet Diversity

#3 Ensure Sustained Adoption & Use through Market Development
- Earn income from sales of roots & processed products
- Buy more Vitamin-A-Rich Foods & Health Services
- Improved Vitamin A Status

Sustainably Improve Young Child Intake of Vitamin A & Energy

AWARENESS: Media campaign to increase demand
Increase area to meet demand
Increase Young Child Feeding Frequency & Diet Diversity

Phase 2: Evidence at the Community Level: Towards Sustainable Nutrition Improvement Study

- Median intake vitamin A almost 8 times higher (24 h recall)
- OFSP contributed 35% of vitamin A intake
- 15% decline in prevalence of vitamin A deficiency in under 5s

Zambezia Province
Central Mozambique (2002-2004)

Low et al., Journal of Nutrition 137: 1320-1327, 2007
Phase 2: Reaching End Users Project (2006-2009) in Uganda & Mozambique

How can we reach larger number of households cost effectively?

- Scaling to 24,000 households with integrated approach, testing 2 levels of intensity
- Randomized controlled trial – effectiveness study
- Improved vitamin A intakes young children & women
- 77% households adopted OFSP in Mozambique; 65% in Uganda
- Highly cost-effective:
  - $15-20 per DALY saved

DALY: Disability Adjusted Life Years

Hotz et al., J of Nutr 142: 1871-80, 2012
Phase 3

SPHI is a multi-partner, multi-donor initiative that seeks to reduce child malnutrition and improve smallholder incomes in 10 million African families by 2020 through the effective production and expanded use of sweetpotato in 17 SSA countries.

The Sweetpotato Action for Security and Health in Africa (SASHA) Project is a 10 year project among 26 partners led by the International Potato Center that will develop the essential capacities, products and methods to reposition sweetpotato in the food economies of Sub-Saharan Africa. It serves as the foundation for the broader initiative.
Breeding in Africa for Africa

- Generate populations to meet needs of users
- "Accelerated" sweetpotato breeding approach to produce varieties in 3-4 years instead of 7-8 years
- By 2016, 42 OFSP varieties bred in Africa released

Now 12 SSA countries are breeding

Making a controlled cross
Mama SASHA

Can linking vitamin A rich orange-fleshed sweetpotato (OFSP) access and nutritional training to existing health services improve the consumption of vitamin A rich foods and improve maternal and child nutrition?

5 year quasi-experimental proof of concept study linking nutrition, agriculture and health (2009-2014) in Bungoma and Busia counties, Western, Kenya

Integrated Partnerships: International Potato Center (CIP) in collaboration with PATH (International Health NGO), Univ. of Toronto, Emory Univ., CREADIS & ARDAP (2 Local Agricultural NGOs), MoA & MoH
What’s new? Focus on 1st 1000 days
Integrated Health Component

Timeline

2008  Design intervention
2010  Pilot
2011 to 2013  Finalize project design
Implementation

Evaluation Process

Formative Research
Operational research I
Baseline survey
Operational research II
Cohort study
Endline survey

Evidence generated on acceptability, feasibility, costs and impact
Inform potential for scale up

2014

Key Components of the Intervention

1. COMMUNITY SENSITISATION
2. ANC CLINIC ATTENDANCE/ NUTRITIONAL COUNSELING
3. VOUCHER ISSUING AT ANC CLINIC
4. VOUCHER REDEMPTION
5. PREGNANT MOTHER’S CLUBS
6. AG EXTENSION ACTIVITIES
Project Achievements and Reach: (March 2011 to August 2013*)

- Over 5,900 women reached
- 215 pregnant/lactating mother clubs formed
- 25,141 attendances
- Voucher issue and redemption

* Excludes pilot results
## Findings among Women

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition and Health Knowledge</td>
<td>Positive in cohort; null in CS</td>
</tr>
<tr>
<td>OFSP production</td>
<td>Positive</td>
</tr>
<tr>
<td>Household diet diversity; food security</td>
<td>Positive</td>
</tr>
<tr>
<td>Maternal OFSP consumption / Consumption of VA rich foods</td>
<td>Positive</td>
</tr>
<tr>
<td>VA intakes / VA Adequacy*</td>
<td>Positive</td>
</tr>
<tr>
<td>MUAC*</td>
<td>Non-significant trend towards protection against declines</td>
</tr>
<tr>
<td>VA Status*</td>
<td>Reduced odds of low RBP at 9 mos postpartum</td>
</tr>
<tr>
<td>Anemia*</td>
<td>Reduced odds of anemia in 3rd trimester</td>
</tr>
</tbody>
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* Only assessed in cohort study

## Results among children < 24m

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFSP consumption / consumption of VA rich foods</td>
<td>Positive</td>
</tr>
<tr>
<td>Diet Diversity Scores</td>
<td>Positive in CS; Null in cohort</td>
</tr>
<tr>
<td>Meeting Minimum Meal Frequency</td>
<td>Positive</td>
</tr>
<tr>
<td>VA intakes*</td>
<td>Positive</td>
</tr>
<tr>
<td>Anthropometry</td>
<td>CS: Significantly reduced odds of stunting in 6-23 mos among full participants; null in cohort</td>
</tr>
<tr>
<td>Low RBP</td>
<td>CS: Significantly reduced odds of low RBP and significantly higher serum RBP among full participants; Null in cohort study</td>
</tr>
<tr>
<td>Anemia*</td>
<td>Null</td>
</tr>
<tr>
<td>Illness*</td>
<td>Null</td>
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</tbody>
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What Factors Drive Participation?

Higher levels of participation correlated with

- Households with higher dependency ratios
- Having previous experience growing sweetpotato
- Living closer to the health facility
- Having a higher wealth index
- Being in the project when Community Health Workers were receiving 1000 Ksh/month ($8) for travel support; this was cut mid-project to 500 Ksh/month by government and affected CHW moral

Multinominal logistic regression. Coefficients compare to NO Participation results.
The efforts of CHWs to identify and mobilize beneficiaries were the indispensable ingredient to project success. In all sites, implementing agents lauded the CHWs’ efforts. Most beneficiaries attributed their decision to visit the health facility to receive ANC, pick the vouchers as well as pick and plant the vines to their efforts and support. Many CHWs went beyond their call of duty to follow up the mothers to ensure that they followed through with the requirements of the project.”

- Mama SASHA Operational Research Report (Machira et al., 2013)

- Recruited pregnant women through home visits
- Ran pregnant women’s clubs
- Attended community events and other outreach events
- Attended monthly feedback meetings
- Some supported nurses at the health facility
- Some made several follow up home visits to beneficiaries
- Annually, they attended training refresher courses
Cost Profile by Activity

- Cost per voucher pair redeemed: $114

Activities:
- Planning/Microplanning: 27%
- Training: 23%
- Development of materials: 15%
- Awareness raising/Sensitization: 9%
- Establish continuous supply of vines: 6%
- Improve knowledge and practices for OFSP: 5%
- Assure adequate and continuous supply of roots to households: 3%
- Health Implementation: 2%
- Integration: 1%
- Capital investment: 1%
- Admin and overhead: 2%

SASHA: Sweetpotato Action for Security and Health in Africa
Scaling lessons across projects

• In scaling up lessons and approaches from MAMA SASHA, several CIP projects have adopted modified versions of MAMA SASHA

• These adjustments have been made to lower cost per beneficiary & reach a larger number of direct beneficiaries.
  • Beneficiary selection methods and voucher use
  • Adoption of counselling materials to local contexts
  • Active participation of men in nutrition programming
  • Value chain development (value addition and marketing)

• A multi-sector, multi-partner approach is necessary for the uptake and adoption of the MAMA SASHA Model
SUSTAIN and VISTA projects

- SUSTAIN and VISTA projects are scaling modified models in 6 countries with the aim of reaching at least 2 million rural households, as well as urban consumers.
- Adapted advocacy & communication
- Local training materials
- Value chains to transform OFSP into products to keep demand for OFSP
- FANEL Lab (nutrient quality & food safety)
- Continued capacity building targeting CHW, Agri. promoters & extension officers
- Partnership (Gov’t, NGOs, Universities)
Current evaluation of the best combinations for scaling up sweetpotato interventions into food systems through behavior change

Six arm, randomized control trial of agriculture (seed systems) - nutrition (messaging & counselling) and market (fresh and transformed) interventions by Michigan State University (MSU) in Rwanda

Rwanda endline led by MSU will be concluded mid 2018 to shed more information on lessons learnt from scaling up Ag-Nutrition- Market interventions

Success of AG-NUTR-HEALTH-MARKETS interventions depend heavily integration with local systems, policy, advocacy and continuous support
As of September 2016, reached 2,895,382 households, 29% of the SPHI 2020 goal.
The Challenge Ahead

- 7.2 million still to be reached…. Significant Advocacy
- Increasing efforts to reach burgeoning urban consumers—emphasizing OFSP-based processed products & fresh roots
- Striving for critical mass of implementers
  -- Increased knowledge & investment requisite

Nane & Kofi Annan advocating in Ghana

OFSP Bread

Power Biscuits

Training of trainers manual on Everything You Ever Wanted to Know about Sweetpotato – published in English, Portuguese, Kiswahili & French

Check out: www.sweetpotatoknowledge.org
For Discussion

1. The need for community-level nutrition interventions seek to change behavior in groups, often using “volunteers”, has emerged as one of the keys to success. Getting women to fully participate at times can be difficult due to other pressing obligations. We have found that it is "easy" to get OFSP into the household diet, but to truly improve young child nutrition, caregivers need to fully participate in the different components. What are techniques you have used to ensure strong participation of caregivers in all components of an integrated ag-nutrition intervention?

2. Integrated Ag-Nutrition interventions have multiple benefits (agriculture, nutrition, knowledge/empowerment, income) but cost-effectiveness analysis and DALYs cannot capture many of the benefits that are hard to put a dollar value on. Thus, the cost per direct beneficiary ($56-114 in our studies) appears high compared to other micronutrient interventions, such as supplementation, that have more limited outcomes. How can we reduce the cost without losing the effectiveness of the approach?