



Agriculture-based Approaches to Fighting Undernutrition

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Complementary Strategies



Optimal breastfeeding
and complementary
feeding

Biofortification:
-Conventional
(orange-fleshed
sweetpotato)
-Transgenic
(Golden Rice)



Micronutrient
supplementation

Food fortification



Diversifying
diets (enhanced
homestead food
production)



3 Examples of Agriculture-based programs to address undernutrition:

- Biofortification
- Enhanced homestead food production programs (bring agriculture-health-nutrition together at community and household level)
- Nutrition-sensitive value chains



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Biofortification: Breeding crops for improved nutrient content

Crop	Nutrient(s)	Conventional or GMO
Sweetpotato	Vitamin A	Conventional
Beans	Iron	Conventional
Rice	Zinc Vitamin A	Conventional Transgenic
Cassava	Vitamin A	Conventional Transgenic
Maize	Vitamin A	Conventional
Wheat	Zinc	Conventional
Banana	Vitamin A	Transgenic
Millet	Iron	Conventional



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Turning Africa Orange!

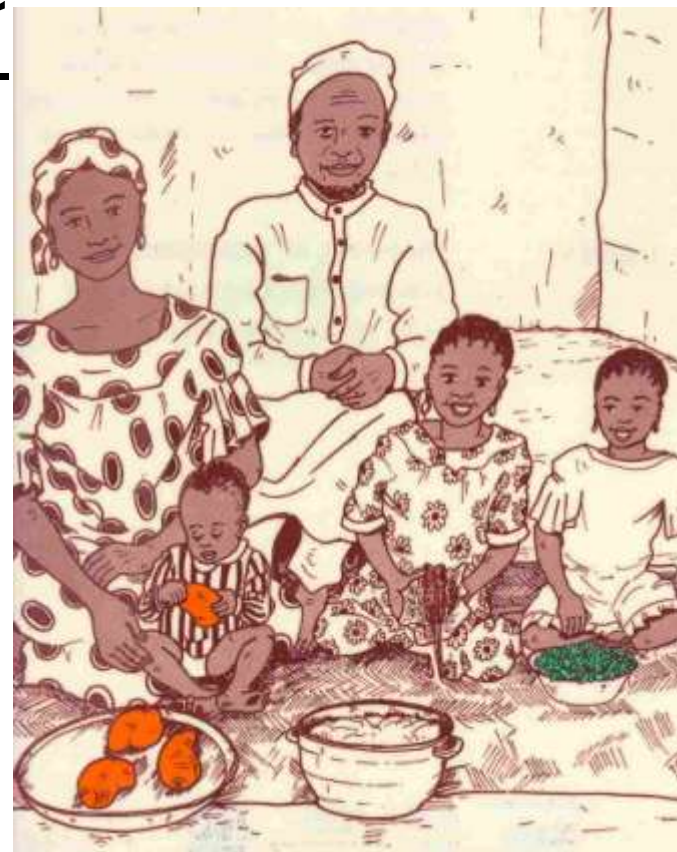
- Great paucity of population-based consumption surveys
- FAO food balance sheets based on national agricultural statistics:
 - Depend on quality of national agricultural statistics
 - Tend to under-estimate production of secondary and/or seasonal crops – particularly sweetpotato
 - Underestimate real and potential sweetpotato production and consumption
 - Don't provide disaggregated estimates for infants, young children, women



Existing consumption data indicate high potential for reach of Orange-Fleshed Sweetpotato (OFSP)

- HKI/FFM – children 1-6 having consumed sweetpotato at least once in last 7 days:

- Niger 40%-65% (different regions)
- Mali 40% (Koulikoro)
- Benin 11.6% (national)



OFSP in Mozambique and Uganda (HarvestPlus)

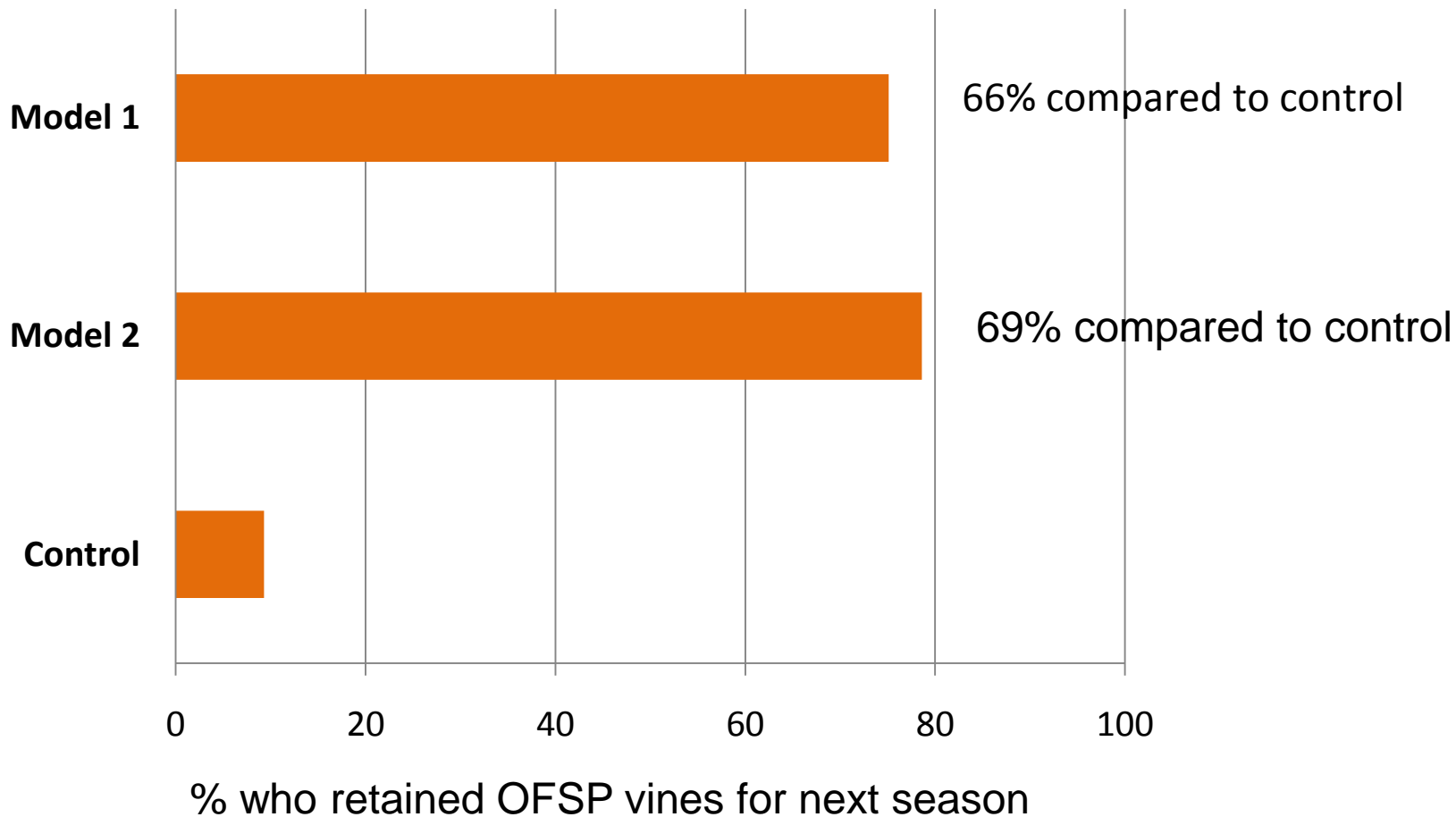
- Intervention:
 - Seed systems (dissemination of vines, farmers' training)
 - Demand creation (nutrition education)
 - Marketing and product development
- Reached 14,000 hh in Mozambique; 10,000 in Uganda
- Dissemination: 2006-09

- Impact evaluation: randomized trial of 1st HarvestPlus crop



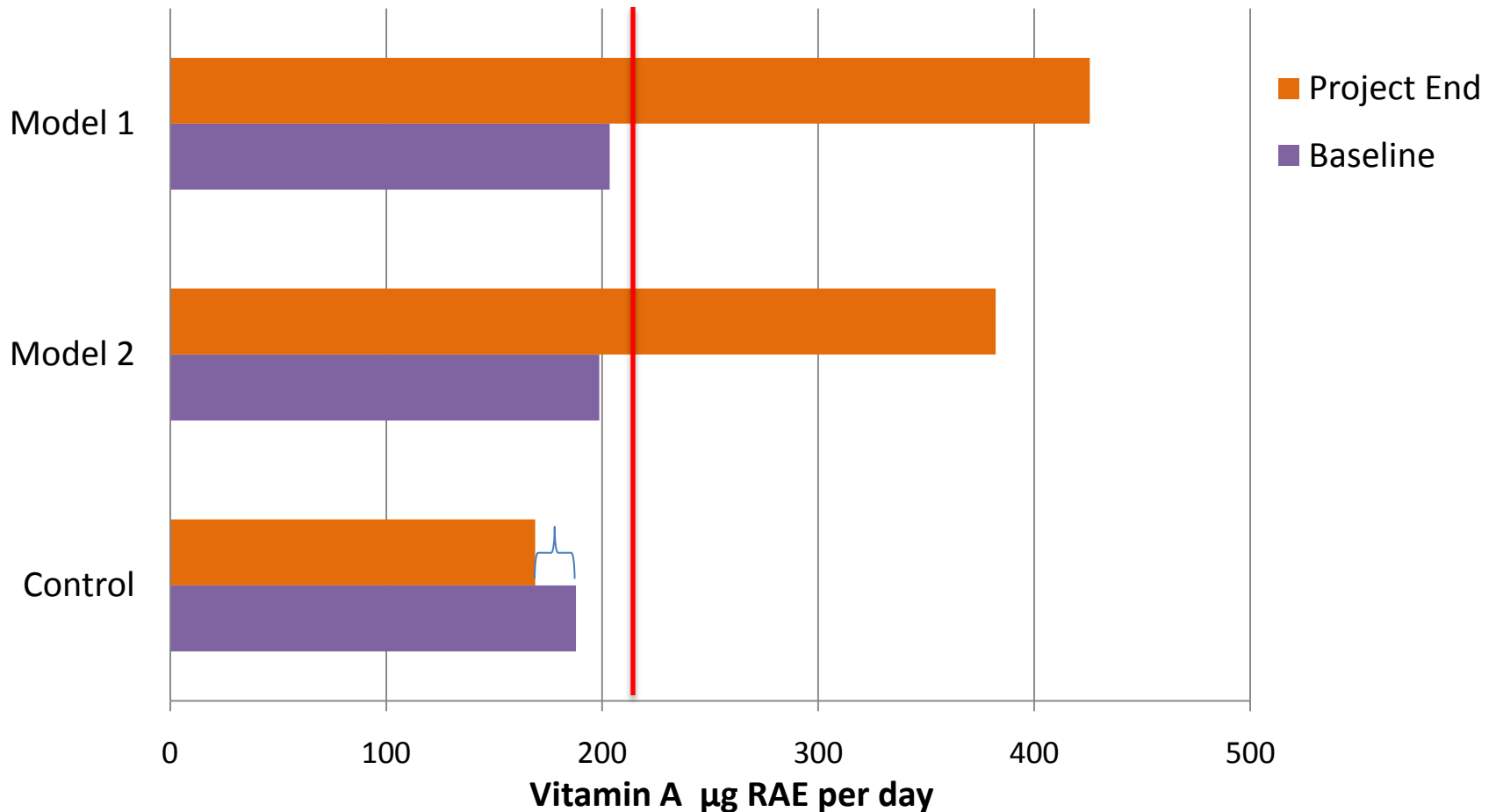
Impact on OFSP Adoption Rate, 2009

Mozambique



Impact on Vitamin A Intakes

Children 6-35 months, Mozambique



HKI's Enhanced Homestead Food Production Program



HKI's Enhanced Homestead Food Production Program



Objective: improve nutritional status of vulnerable members of low income households through home production of micronutrient (MN) rich crops and small animals, poultry ...

- Nutritional focus now broadened to include **child growth** and not just micronutrient deficiencies
- Emphasis on **year round production** of local micronutrient-rich crops and animal source foods
- Focus on improving **local farming practices** to extent possible

HKI's E-HFP Program...

Primary pathways to achieve impact on nutrition:

1. Increased availability of micronutrient-rich foods through increased household **production** of these foods.
2. Increased **income** through the sale of surplus production.
3. Increased knowledge and adoption of optimal nutrition practices including **consumption** of micronutrient-rich foods through **behavior change communication**.
4. Linkages established with local **health services**.

HKI's E-HFP Program...

Where? Since 1990, now in four countries in Asia:
Bangladesh, Nepal, Cambodia and Philippines.

Launched in Africa in Burkina Faso (with IFPRI) and
Tanzania

Coverage? Cumulatively more than 5 million people directly
reached (950,000 families with majority in Bangladesh)

Who? Primarily targets women farmers from poorer
households

HKI's E-HFP Program...

- HKI partners with government field agents and local NGOs for 3 year cycle
- Establish Village Model Farms (serve ~ 40 households)
- Provide seeds, saplings and chicks
- Provide agricultural training in optimal techniques for crops and raising small animals and fowl
- Make market linkages when needed
- Provide links to health services and nutrition behavior change communication

Some results...

Consistently improve:

- Household production of micronutrient-rich foods
- Household consumption of micronutrient-rich foods
- Consumption of micronutrient-rich foods among mothers and children

Some evidence that they improve:

- Income (especially under women's control)
- Women's empowerment (HH decision-making)

Inconsistent evidence that they improve:

- Health outcomes
- Nutritional status outcomes (anemia, night blindness)

Challenges in Bringing OFSP & E-HFP to Africa:

- Water is a limiting factor
- Relatively weak public-sector agriculture research and extension systems and low coverage of NGOs
- Realigning extension systems to value smallholder, women farmers
- Sustaining seed systems
 - Special challenges of vegetatively propagated crops like OFSP
- Protecting gardens from livestock
- Evaluation methodology that will capture multiple benefits



Ongoing & Future Work:

- Sweetpotato for Security and Health in Africa (with International Potato Center – CIP)
- Reaching Agents of Change for Orange-Fleshed Sweetpotato (with CIP):
 - Burkina Faso
 - Ghana
 - Nigeria
- Enhanced Homestead Food Production incorporating OFSP in Burkina Faso



Donors:

- United States Agency for International Development
- Bill and Melinda Gates Foundation (through CIP and HarvestPlus)
- IrishAid
- Government of Taiwan
- European Union



Some Resources:

Biofortification:

<http://www.harvestplus.org>

<http://biofortconf.ifpri.info>

Orange-Fleshed Sweetpotato:

<http://sweetpotatoknowledge.org>

Enhanced Homestead Food Production:

<http://www.hki.org/reducing-malnutrition/homestead-food-production>

<http://www.ifpri.org/book-5826/ourwork/programs/2020-vision-food-agriculture-and-environment/millions-fed-initiative>

