Flagship Project 4: Nutritious RTB Food and Value Addition through postharvest innovation

SIMON HECK • RTB ISC F2F MEETING
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Objectives

Flagship Project 4 works to support the fuller, equitable, and sustainable utilization of RTB crops for healthier diets and improved income opportunities.

Drivers of change

- **Consumer power**
  Changing food preferences, increased nutrition awareness

- **Changing markets**
  Urbanization, processing technologies, environmental footprint

➢ Transforming RTB crops to meet the nutrition needs and consumer preferences of a changing world.
Clusters

CC4.1 Demand-led approaches to drive *post-harvest innovation* and nutritious RTB products

*Busie Maziya-Dixon*

CA4.2 Raising incomes and improving health and safety at small-medium *cassava processing* centers

*Thierry Tran*

CA4.3 *Biofortified cassava* varieties for improved nutrition and livelihoods

*Elizabeth Parkes*

SW4.4 *Nutritious sweetpotato* for expanding markets and healthier diets

*Robert Ackatia-Armah*
### Key scientific achievements 2017

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Selected highlights</th>
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<tbody>
<tr>
<td>CC4.1</td>
<td>Technologies verified for cassava waxing and sweetpotato-based silage</td>
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<tr>
<td>CA4.2</td>
<td>Influence of environmental factors on quality traits of cassava</td>
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<tr>
<td>CA4.3</td>
<td>Comparative analysis of biofortified cassava and white varieties</td>
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<tr>
<td>SW4.4</td>
<td>Consumer studies; value chain of purée of biofortified sweetpotato</td>
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CC4.1 – Postharvest innovation

Reducing post-harvest losses

Waxing of cassava roots in Uganda

- Technology adapted from Colombia
- Extends shelf-life from 3 to up to 14 days [in combination with pruning]
- Initial uptake in supermarkets
CC4.1 – Postharvest innovation

Utilization of by-products and waste

Improved sweetpotato-based silage

• Bridges seasonal feed gaps; 40% lower costs than commercial feed
• Improved productivity of smallholder pig production
• Silage Business Centers (privately managed) – silage, equipment rental, training
• Pig Production and Marketing Ltd promoting silage among its suppliers
CA4.2 – Cassava processing

Environmental factors strongly influence quality traits (up to 400% variation)

- 32 harvests of 7 varieties 10 months after planting, every 15 days for 16 months

- Evaluation of postharvest physiological deterioration (PPD), cyanide, dry matter

- Cooking (boiling) quality under evaluation
CA4.2 – Cassava processing

User preferences and processing ability of improved cassava varieties in Cameroon (Bertoua)

- Fiber content and quality the key preference criteria for processors (before yield and texture)
- High-fiber roots increase processing time and drudgery
  - especially where fiber distributed under skin (rather than a central artery)
- 18 varieties tested; 1 outstanding
CA4.3 – Biofortified cassava

Comparing processing qualities of biofortified cassava varieties and white varieties

<table>
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<tr>
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<th>Biofortified</th>
<th>White</th>
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<tbody>
<tr>
<td><strong>Proximate analysis:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Starch content (g/100g)</td>
<td>67.1 - 82.4</td>
<td>69.6 - 77.8</td>
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<tr>
<td><strong>Pasting quality:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Peak viscosity (RVU)</td>
<td>295.6 - 467.0</td>
<td>271.9 - 471.3</td>
</tr>
</tbody>
</table>

- Significant differences (P < 0.05) between different cassava genotypes
- **Biofortified varieties are competitive** with conventional clones in proximate composition and peak viscosity
- **Yellow HQCF is suitable for use** in bread, other bakery products, and other food applications (thickener, stabilizer etc.)

CA4.3 – Biofortified cassava

Nutritious snack food alternatives using high-quality flour of biofortified cassava with soybean and cowpea strips

- Sensory evaluation of three products in Nigeria and DRC: Consumer preferences differ greatly
- Versatility of yellow HQCF as an ingredient
- Commercial partner NIJI LUKAS (Nigeria)

SW4.4 – Nutritious sweetpotato

Behavior change research to support health outcomes

Longitudinal study on maternal health outcomes (Kenya)

• Continued higher Vitamin A intake and better Vitamin A status of women who participated in agriculture-nutrition interventions at antenatal stage


Effect of nutrition information on consumer sensory experiences and evaluations (Kenya)

• Information on nutrition benefits have little influence on sensory experience and consumer evaluation

• Adding ‘emotional profiling’ to sensory evaluation (*EmoSemio*) predicts preferences and adoption better than sensory evaluation metrics alone

• Important to combine information with demonstrations

SW4.4 – Nutritious sweetpotato

OFSP purée – a platform for food innovations

Looking ahead: Opportunities and challenges

Collaboration

• Link with breeding work under FP2
  • Good collaboration on recent CIRAD-led RTB FOODS proposal
  • Good practice breeding-postharvest collaboration within crop programs

• HarvestPlus new strategy
  • More information needed
  • Find modus operandi

• “Food safety in RTB value chains” training (Oct 2017)
  • CIP, NRI, BecA, U Queensland
Looking ahead: Opportunities and challenges

Funding support for postharvest innovations

• Regional investments:
  • AGRA
  • AfDB/TAAT
  • IFAD Asia and Africa

• Country level investments:
  • EU in Asia and Africa

➢ Strong case for RTB as a platform to address shared challenges and broaden impacts together (multiple crops)
Looking ahead: Opportunities and challenges

Commercial pathways to scaling

• Sweetpotato business-to-business partnerships US-Africa
• RTB FP4 role: technology and knowledge transfer, assessing development impacts
• Opportunities for research on scaling (FP5)
Looking ahead: Opportunities and challenges

2017:
Growing together as a team,
Committing to our research agenda
Thank you
Asante sana