Food Aid Quality Review (FAQR)
Tufts University Dissemination Meeting

Hosted by The TOPS Program

Washington, DC
September 8, 2016
Food Aid Quality Review - Overview

• FAQR Phase I: Title II food aid ‘fit for purpose?’
  • April 2009 – September 2011
  • Delivering Improved Nutrition: Recommendations for Changes to U.S. Food Aid
  • Scientific consultations
  • Identifying differences across product specifications

• FAQR Phase II: Implement recommendations
  • October 2011 – January 2016
  • Multiple field studies
  • Stakeholder consultations

• FAQR Phase III: Implement recommendations
  • February 2016 – January 2019
  • Continue field studies
  • Added research areas
Helping USAID/FFP ensure that food aid products are evidence-based to achieve best outcomes (fit for purpose)

Focus on cost-effectiveness of outcome, not just cost of the products

Efficiency gains across USG and global food aid players
Summary of FAQR II Accomplishments - Products

- New specifications adopted for 21 food aid products
  - 8 products have new specifications after micronutrient level upgrades (All-Purpose Wheat Flour, Bread Flour, Bulgur, Soy Fortified Bulgur, Cornmeal, CSB+, Soy Fortified Cornmeal, Veg Oil)
  - 8 products added to Title II list (Dried Dairy Ingredients (WPC34 and WPC80,) HEBs, RUTF, Super Cereal+)
  - Milled Rice specs updated (part of Fortified Rice work)
  - 4 products in development, draft specs written in FAQR II (Rice Soy Blend+, Supercereal +, Rice, Wheat Soy+).
Summary of **FAQR II - Products**

- **New sorghum-pea blend** and lipid-based products formulated and being field tested; other options
- **Ready-to-Use Foods (RUFs)** now included in basket
- **Dry dairy ingredients** (WPC34 and WPC80) also included
Summary of **FAQR II Accomplishments** - **Products**

- **Accelerated Shelf-Life Study**: Products Tested

  2 CSWB and 1 CSB+: 8 25-kg bags

  SC+: 16 1.5-kg bags

  RUSF: 24 92-g sachets

  Veg Oil: 8 4-L steel cans
Summary of **FAQR II Accomplishments - Products**

- **Accelerated Shelf-Life Study: Decline in Vitamin A in CSWB**

![Graph showing vitamin A decline over time](image-url)
Summary of **FAQR II Accomplishments - Products**

- Accelerated Shelf-Life Study: Vitamin A Maintained in RUSF

![Graph showing vitamin A maintenance in RUSF over time](image-url)
Summary of **FAQR II Accomplishments - Products**

- Accelerated Shelf-Life Study: Vitamin A Maintained in FVO
Summary of **FAQR II** Accomplishments - Products

- Accelerated shelf life/stability testing should be conducted on all new & significantly changed products
  - Cost to be built into the cost of bringing products on line

- No new nutrient levels should be required until studies are complete

- Vit A suppliers should develop methods to improve A stability

- Further research is needed to determine optimal food delivery vehicles for vitamin A

- New packaging will be assessed to reduce vitamin degradation
Areas for Further Exploration

• Degradation of vitamin A
  – Optimization of formulation or of ration composition to account for degradation
  – Additional shelf-life studies of micronutrient stability (i.e. HEBs, fortified rice, protein ingredients)

• Improved packaging
  – Example: Oil cans v. plastic bottles
  – Optimization of packaging size and new packaging materials
  – Protecting food integrity

• Adequate micronutrient levels at point of consumption
  – Supply chain management
  – Oil availability and use in the household
  – Food matrices (bioavailability once consumed)
Summary FAQR II Accomplishments - Process

USAID/USDA/other USG
- Technical working groups set up across agencies on auditing, food safety, and quality assurance

Global (USAID, WFP, UNICEF, MSF)
- Formal Terms of Reference adopted; FAQR as secretariat
- Harmonization of specs (premix, macronutrient composition)
- Dialogue on harmonization of packaging, labeling, programming
- Food safety standards, joint-audits, novel products
- Successful promotion of single RUF
- Engagement with Codex Alimentarius on global RUF standards
Summary FAQR II Accomplishments - Evidence

Research Engagement on Food Innovation for Nutritional Effectiveness (REFINE)

32 currently ongoing studies

- Product Innovation
- Program Innovation
- Cost Effectiveness
- Effectiveness
- Efficacy
- Use
- Acceptability
- Composition

MAM-specific  MAM/SAM/Stunting
Summary of FAQR II Accomplishments - Evidence

- Field studies ongoing or complete:
  - Field Study #1: **Malawi**, complete
  - Field Study #2: **Burkina Faso**, ongoing, enrollment complete
  - Field Study #3: **Sierra Leone**, stopped, (Ebola)
  - Field Study #4: **Sierra Leone**, in preparation phase
Malawi Study (complete): CSB + oil and packaging/messaging

- Beneficiaries added more oil in both intervention groups
- Average oil:CSB ratio \( \sim 26:100 \) in intervention, \( 12:100 \) in control
- **Most cost-effective** intervention was oil + SBCC
  - Lowest cost in reaching porridge at target oil:CSB ratio
- **Messaging** (on packaging) did not improve compliance
- **Repackaging** has added benefits
  - e.g. hygiene, reduced distribution time, preference
- **Sharing highest in Control Group**
  - When sharing occurred, most common among children \(<5y\)
The SBCC functioned on several different levels of the socio-ecological framework, including individual, relationship, and community levels.
Malawi Study: SBCC Intervention

- This analysis found that, overall, the **flow of SBCC** functioned as intended in the care group model.

- Information was **successfully exchanged**, helping to achieve the objective of increasing oil content of porridge prepared by caregivers.
**Malawi Study: Implications for Program Implementation**

- **Beneficiaries can add more oil** to CSB porridge if given sufficient oil and SBCC
  - **Flow of SBCC functioned as intended in the care group model**
  - **Information was successfully exchanged in the care group model**

- **Smaller bags** reduce handling breakpoints (with potential benefits to food safety and dignity)

- Collecting **cost-effectiveness** information provides a sound basis for program decisions
  - Costs include products, transportation, storage, and distribution, and time and money costs to beneficiaries
**Sierra Leone Study (stopped due to Ebola): Treatment of MAM**
*(sample size insufficient for hypothesis testing)*

<table>
<thead>
<tr>
<th>Recovery and time to recovery among those enrolled ≥ 10 weeks prior to study suspension, n=954</th>
<th>SC+ (comparison)</th>
<th>SC</th>
<th>RUSF</th>
<th>CSWB</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%) or mean ± SD</td>
<td>n=284</td>
<td>n=149</td>
<td>n=277</td>
<td>n=244</td>
</tr>
<tr>
<td>Percent recovered</td>
<td>171 (60.2)</td>
<td>88 (59.1)</td>
<td>141 (50.9)</td>
<td>114 (46.7)</td>
</tr>
<tr>
<td>Among those who recovered</td>
<td>n=171</td>
<td>n=88</td>
<td>n=141</td>
<td>n=114</td>
</tr>
<tr>
<td>Time to recovery (weeks)</td>
<td>4.7 ± 2.6</td>
<td>4.3 ± 2.5</td>
<td>5.8 ± 2.9</td>
<td>5.5 ± 2.8</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Growth outcomes among those with at least 2 research visits, n=1259</th>
<th>SC+ (comparison)</th>
<th>SC</th>
<th>RUSF</th>
<th>CSWB</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%) or mean ± SD</td>
<td>n=367</td>
<td>n=189</td>
<td>n=377</td>
<td>n=326</td>
</tr>
<tr>
<td>Weight gain, first 4wks (g/kg/d)</td>
<td>1.9 ± 2.3</td>
<td>1.8 ± 2.6</td>
<td>1.2 ± 2.6</td>
<td>1.7 ± 2.9</td>
</tr>
<tr>
<td>MUAC gain, first 4wks (mm/d)</td>
<td>0.1 ± 0.3</td>
<td>0.2 ± 0.3</td>
<td>0.1 ± 0.3</td>
<td>0.1 ± 0.3</td>
</tr>
<tr>
<td>Length gain, total (mm/d)</td>
<td>0.4 ± 0.4</td>
<td>0.4 ± 0.6</td>
<td>0.2 ± 0.5</td>
<td>0.4 ± 0.5</td>
</tr>
</tbody>
</table>
Effects of Ebola Virus Disease are unknown

Overall recovery rate was 54% - lower than usually observed in other MAM treatment studies

Growth outcomes varied among the study groups – no one food consistently performed best

WHZ and MUAC were weakly correlated ($r=0.38$, $p<0.0001$)

These results raise questions about the metrics commonly used to identify MAM and define “recovery” in MAM treatment programs

Cost-effectiveness data is critical for programmatic decision making

- RUSF at a lower calorie content per dose was most costly per treated and per recovered child
Sierra Leone Study (New)- Context

The Setting: Pujehun District
– Southern tip – border with Liberia
– Confirmed first case of Ebola in July 2014
– First district to declare itself Ebola Free (Jan. 2015)

Essential Statistics
– 70% of children U5 are categorized as stunted
– 8.5% are classified with MAM
– 3.1% with SAM

• Timeline
– Start-up Phase: Sept-Dec, 2016
– Implementation Phase: Jan. 2017 – March 2018
– Closeout: April-June, 2018
Sierra Leone Study (New): Objectives

• Objective 1: Effectiveness
To determine whether there are differences in recovery and growth rates among children with MAM treated with one of four supplementary foods.

• Objective 2: Determinants of Effectiveness
Discern intervention components, behaviors, demographics and other factors contributing to effectiveness.

• Objective 3: Cost Effectiveness
Assess program costs among the four study arms to determine the cost effectiveness of each supplement, of achieving secondary outcomes and of compliance with recommended preparation and consumption patterns.

• Objective 4: “Quality” of recovery
Assess differential impact of the four foods on body composition, brain function, and gut function (enteropathy)
Sierra Leone Study (new): The Four Foods, isocaloric

- **Super Cereal Plus with Amylase (SC+)**
  - acts as control group
  - composition: maize, whole soybeans, sugar, whey protein, vegetable oil, and vitamin/mineral premix

- **Corn-Soy Blend Plus Fortified Vegetable Oil (CSB+)**
  - no milk protein, amylase increases consumption
  - composition: maize, whole soya beans, and vitamin mineral premix

- **Corn-Soy-Whey Blend Fortified Vegetable Oil (CSWB)**
  - updated formulation of USAID’s CSB13 to include whey protein
  - composition: corn meal, soy flour, vegetable oil, whey protein concentrate, and micronutrients

- **Ready-to-use-Supplementary Food (RUSF)**
  - fortified lipid-based paste/spread
  - composition: heat treated oil seeds, pulses, cereals, sugar, milk powder, vegetable oils, vitamins and minerals
Sierra Leone Study (New): Design

Cluster-Randomized Design

4 Foods = 4 Arms

Followed 12 weeks or until recovered and up to 6 mo. afterwards (Effectiveness)

Randomly select subsample for interview/observation (Cost/Determinants)

28 Peripheral Health Units

(SC+)

(CSB+)

(CSWB)

(RUSF)

2 week rations
Burkina Faso Study: Prevention of Stunting and MAM Objectives

• **Objective 1: Effectiveness**
  To compare the effectiveness of the provision of four supplementary foods in preventing stunting and wasting, and promoting linear growth in children 6 – 23 months in the context of a preventive supplementary feeding program in Burkina Faso.

• **Objective 2: Cost & Cost-Effectiveness**
  To determine total costs per treatment per child for each study arm and estimate the cost-effectiveness per case of stunting (and wasting) averted among study arms.

• **Objective 3: Process and Determinants of Effectiveness**
  To evaluate the determinants of effectiveness including: consumption/targeting adherence, preparation compliance, sharing/selling of supplement, perceived barriers to adherence, hygiene practices and household characteristics such as SES.

• **Objective 4: Growth Trajectory**
  To determine the effect of the four supplements on other measures of growth
Burkina Faso Study: Prevention of Stunting and MAM

Timeline

Enrollment
Months 1-12

Study data collection
Months 2-30

3 month follow-up
Months 27-30

13 August 2014

2015
2016
March 2017
### Enrollment and follow-up information, Burkina Faso FAQR, July 2016

<table>
<thead>
<tr>
<th></th>
<th>Number children enrolled</th>
<th>Excluded for SAM* at enrollment</th>
<th>SAM* Referrals: Follow-up</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>1519</td>
<td>24</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Group 2</td>
<td>1513</td>
<td>13</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Group 3</td>
<td>1565</td>
<td>16</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>Group 4</td>
<td>1504</td>
<td>15</td>
<td>50</td>
<td>34</td>
</tr>
<tr>
<td>TOTALS</td>
<td>6101</td>
<td>68</td>
<td>141</td>
<td>114</td>
</tr>
</tbody>
</table>

*Severe Acute Malnutrition screened using mid-upper arm circumference, where < 115 mm = SAM*
Burkina Faso: Insights from ongoing study

• Beneficiary practices:
  – Sharing with other children in the family is universal
  – Sharing with other families is common
  – Flour (CSB+, CSB14, SC+) often eaten dry

• Storage and transport:
  – Difficult to store the foods in the warehouse at the appropriate temperature (<30C), as temperatures usually exceed 40C
  – Transport of RUSF and SC+ is more expensive due to surface area to volume ratio (these commodities are very light but take up a lot of space).
Evidence on Cost-effectiveness

- For the cost-effectiveness analysis, a comprehensive cost matrix was developed to calculate total cost per enrolled child for each specialized food aid product.
- Cost data were collected for commodity, repackaging, transportation, storage, distribution, commodity losses, and beneficiary time and costs.
FAQR Phase III: Improved packaging

- Enhancing/retaining nutrients in food aid products
- Extending product shelf life
- Improving transportability
- Resisting pest infestation
- Packaging as a vehicle for messaging
FAQR Phase III: Bioavailability, absorption (matrices)

• Ways to improve food digestibility and ability of consumers to absorb nutrients
  – Physiological use of nutrients
  – Amylase addition
  – Extrusion techniques
  – Other food ingredients (for shelf-life, digestibility)
FAQR Phase III: Supply Chain

• **Optimizing supply chain management**
  – Single websites/commodity management systems for FFP and USDA updates on specifications, food quality feedback from field, etc.
• **Identifying appropriate commercial practices (product tracking technology, etc.)**
• **Focus on the last mile of the distribution chain**
• **Scenario building for optimizing procurement, delivery**
• **Role of pre-positioning in the pipeline**
FAQR Phase III: Food Safety and Quality Assurance

• Quality Assurance feedback system

• Implications of Food Safety and Modernization Act (FSMA) for food aid products

• Local and Regional Procurement
  – Auditing, Sampling, and Inspection
FAQR Phase III: Future Evidence and Practice

• Developing a Community of Practice; USG Working Groups

• Evidence Summit
  – Share advances and challenges in food aid research, new questions.

• Research
  – New metrics and measures for sustained recovery.
  – Understanding etiology of malnutrition, prevention and treatment programs, improved protein quality.
  – Environmental enteric dysfunction (EED), lean mass versus fat mass accretion, neurological/cognitive function.

• Operational questions
  - Optimizing SBCC, last mile concerns, guidance on food product choices for cost-effective impacts, reaching adolescent girls/pregnant women, linking development and emergency programming, etc.
Future Meetings/Opportunities to be involved in FAQR

- Food Matrices Workshop - **FY17**
- Food Aid Basket Workshop (Existing commodities, new commodities, dual-use products) - **FY17**
- Food Protection Workshop (food aid packaging, storage, pests, messaging) - **FY17**
- Cost Projection Tool and Cost Matrix Presentation - **FY18**
- Dissemination of Results - Burkina Faso Study - **FY18**
- Dissemination of results - Sierra Leone treatment study - **FY19**
- FAQR Phase III - Evidence Summit - **FY19**

*We are revamping the FAQR website so all reports, manuscripts, presentations and information on FAQR are easily accessible. Stay tuned...*
Thank you! Q&A will come after breakout session.
Breakout Session-30 minutes

• **Purpose:** To engage participants in deeper discussion about the results of FAQR Phase II and provide an opportunity for participants to ask more focused questions in their small groups.

• **Discussion Topics:**
  – How do you see the results presented today influencing program implementation and design?
  – What aspects of the FAQR Phase III results are you most interested in and why? (what do you hope to learn from FAQR Phase III.)
Questions?