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Table of Contents

Publications

Reports

Posters
Advancing Nutrition in the International Food Assistance Agenda: Progress and Future Directions Identified at the 2018 Food Assistance for Nutrition Evidence Summit

Factors that May Influence the Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso

Cost-Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso: A Geographically Randomized Trial

Program Changes are Effective and Cost-effective in Increasing the Amount of Oil Used in Preparing Corn-Soy Blend Porridge for Treatment of Moderate Acute Malnutrition: An FAQR study in Malawi

The Role of Dairy in the Comparative Effectiveness and Cost of Fortified Blended Foods Versus Ready-to-Use Foods in Treatment of Children with Moderate Acute Malnutrition: A Narrative Review

Preparation and Presentation of Corn-Soy Blend for Moderately Malnourished Children in Malawi

Self-report vs. Direct Measures for Assessing Corn-Soy Blend Porridge Preparation and Feeding Behavior in a Moderate Acute Malnutrition Treatment Program in Southern Malawi

Effective Delivery of Social and Behavior Change Communication through a Care Group Model in a Supplementary Feeding Program

Making Food Aid Fit-for-Purpose in the 21st Century: A Review of Recent Initiatives Improving the Nutritional Quality of Foods Used in Emergency and Development Programming

A review of research methods used to study specialised nutritious foods
Food aid for nutrition: A landscape review of current research and implications for future studies ..................16

Factors that May Influence the Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso .................................................................17

Cost-Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso: A Geographically Randomized Trial .................................................................18

Impact of stakeholder perspectives on cost-effectiveness estimates of four specialized nutritious foods for preventing stunting and wasting in children 6–23 months in Burkina Faso .................................................................19

Fortified blended flour supplements displace plain cereals in feeding of young children ..........................20
Advancing Nutrition in the International Food Assistance Agenda: Progress and Future Directions Identified at the 2018 Food Assistance for Nutrition Evidence Summit

**AUTHORS:** Lindsey Ellis Green, Ilana Cliffer, Devika Suri, Kristine Caiafa, Beatrice Rogers, and Patrick Webb

**DATE/JOURNAL PUBLISHED:** September 2019; Sage Journals and Food and Nutrition Bulletin

**THEMES:** food aid, food assistance, nutrition, emergency response, humanitarian, development, global health, maternal and child health, malnutrition

**ABSTRACT:**

Background: Global food insecurity persists despite continued international attention, necessitating evidence-based food assistance interventions that adequately address nutritional concerns. In June 2018, the US Agency for International Development’s Office of Food for Peace through the Food Aid Quality Review (FAQR) project sponsored a “Food Assistance for Nutrition Evidence Summit” to share evidence relevant to policy and programmatic decision-making and to identify critical evidence gaps.

Objective: This article presents 4 priority areas to advance nutrition in the international food assistance agenda generated through presentations and discussions with the food assistance community at the Evidence Summit.

Methods: Priority areas were identified after the Evidence Summit using a combination of FAQR team discussions, review of presentations and official notes, and supporting literature.

Results: Key priority areas to advance nutrition in the international food assistance agenda are as follows: (1) increase research funding for food assistance in all contexts, paying particular attention to emergency settings; (2) research and adopt innovative ingredients, technology, and delivery strategies in food assistance products and programs that encourage long-term well-being; (3) redefine and expand indicators of nutritional status to capture contextual information about the outcomes of food assistance interventions; and (4) augment communication and collaboration across the food assistance ecosystem.

Conclusions: These priorities are critical in a time of increased humanitarian need and will be key to fostering long-term resilience among vulnerable groups.

**CITATION:**

Factors that May Influence the Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso

AUTHORS: Breanne Langlois, Ilana Cliffer, Laetitia Nikiema, Devika Suri, Franck Garanet, Ye Shen, Augustin Zeba, Shelley Walton, Hermann Lanou, Patrick Webb, and Beatrice Rogers

DATE/JOURNAL PUBLISHED: January 2020; Current Developments in Nutrition 4, no. 2

THEMES: supplementary feeding, children under 5, corn–soy blend, lipid-based nutrient supplements, stunting, wasting, specialized nutritious food, Burkina Faso

ABSTRACT:
Background: A trial in Burkina Faso compared the cost-effectiveness of 4 specialized nutritious foods (SNFs) used to prevent stunting and wasting in children aged 6–23 mo.
Objectives: This article explores differences in SNF use that may have influenced effectiveness, specifically in relation to consumption by the recipient child and by any other person (i.e., sharing), other diversion from the recipient child, preparation, storage, and hygiene.
Methods: Subsamples from a geographically clustered, longitudinal trial with random assignment to Corn Soy Blend Plus with oil (CSB+ w/oil), Corn Soy Whey Blend with oil (CSWB w/oil), Super Cereal Plus (SC+), or ready-to-use supplementary food (RUSF) were selected for in-depth interviews, in-home observations, and focus group discussions.
Results: Sharing was common in all arms, with the highest reported in SC+ (73%) and highest observed in CSWB w/oil (36%). Some reported giving the ration away (highest in SC+ at 17%) or using it for other purposes (highest in CSWB w/oil at 17%). The recipient child was observed consuming the ration in 49% of households on average (38–60% by arm in CSB+ w/oil and RUSF, respectively). Qualitative reports of bitterness and spoilage emerged in the CSWB w/oil arm. Most observed households (excluding RUSF) did not prepare porridge daily as instructed (35–46% by arm). Household water samples showed either high-risk or unsafe contamination with Escherichia coli (72–78% by arm). Low percentages were observed handwashing (both child and server) before consuming the porridge.
Conclusions: The SNFs were not prepared or served as intended and diversion from the recipient was common. Storage conditions may have resulted in spoilage of the ration containing whey before reaching recipients. This article provides context about factors that may have influenced the effectiveness of these SNFs. Programming and household use of SNFs are as important as their nutrient composition. This trial was registered at clinicaltrials.gov as NCT02071563.

Cost-Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso: A Geographically Randomized Trial


DATE/JOURNAL PUBLISHED: January 2020; Current Developments in Nutrition 4, no. 2

THEMES: food aid, children, supplementary feeding, complementary feeding cost-effectiveness, corn-soy blend, lipid-based nutrient supplements, low-income countries, stunting, wasting

ABSTRACT:

Background: There is a variety of specialized nutritious foods available for use in programs targeting undernutrition, but evidence supporting the choice of product is limited.

Objectives: We compared the cost-effectiveness of 4 specialized nutritious foods to prevent stunting and wasting in children aged 6–23 mo in Burkina Faso.

Methods: Four geographic regions were randomly assigned to 1 of 4 intervention arms: Corn-Soy Blend Plus (CSB+) programmed with separate fortified vegetable oil (the reference food), Corn-Soy-Whey Blend (CSWB; a new formulation) with oil, SuperCereal Plus (SC+), and ready-to-use supplementary food (RUSF). We compared the effects of each intervention arm on growth (length-for-age z score (LAZ), weight-for-length z score (WLZ), end-line stunting (LAZ < −2), and total monthly measurements of wasting (WLZ < −2). Rations were ~500 kcal/d, distributed monthly. Children were enrolled in the blanket supplementary feeding program at age ~6 mo and measured monthly for ~18 mo. Average costs per child reached were linked with effectiveness to compare the cost-effectiveness of each arm with CSB+ with oil.

Results: In our sample of 6112 children (CSB+, n = 1519; CSWB, n = 1503; SC+, n = 1564; RUSF, n = 1526), none of the foods prevented declines in growth. Children in the SC+ and RUSF arms were not significantly different than those in the CSB+ with oil arm. Children in the CSWB with oil arm experienced higher end-line (measurement at age 22.9–23.9 mo) stunting (OR: 2.07; 95% CI: 1.46, 2.94) and more months of wasting (incidence rate ratio: 1.29; 95% CI: 1.09, 1.51). CSB+ with oil was the least-expensive ration in all costing scenarios ($113–131 2018 US dollars/enrolled child) and similar in effectiveness to SC+ and RUSF, and thus the most cost-effective product for the defined purposes.

Conclusions: CSB+ with oil was the most cost-effective ration in the prevention of wasting and stunting in this trial. This trial was registered at clinicaltrials.gov as NCT02071563.

Program Changes are Effective and Cost-effective in Increasing the Amount of Oil Used in Preparing Corn-Soy Blend Porridge for Treatment of Moderate Acute Malnutrition: An FAQR study in Malawi

**AUTHORS:** Beatrice Rogers, Lauren Wilner, Gray Maganga, Shelley Walton, Devika Suri, Breanne Langlois, Ken Chui, Jocelyn Boiteau, Stephen Vosti, Patrick Webb

**DATE/JOURNAL PUBLISHED:** 2016

**THEMES:** corn soy blend, food aid, fortified blended food, moderate acute malnutrition, social and behavior change communication, supplementary feeding

**ABSTRACT:** Corn Soy Blend (CSB) porridge is commonly prepared with oil for treatment of moderate acute malnutrition (MAM). A recent review recommended that 30 g of oil be used with 100 g of CSB to increase energy density and micronutrient absorption. This study assessed the effectiveness and cost-effectiveness of program changes aimed at achieving that target oil:CSB ratio in prepared porridge. Caregivers of children in MAM supplementary feeding programs were assigned to three groups: a control group received monthly rations of 1 L oil, 8 kg CSB in bulk, and social and behavior change communication (SBCC); intervention groups received 2.6 L oil, 8 kg CSB provided either in bulk (Group 1) or four 2-kg packages with printed messages (Group 2), and enhanced SBCC emphasizing the target oil:CSB ratio. Compared to the control, both intervention groups had higher mean added oil per 100 g CSB (18 g, \( p < 0.01 \), and 13 g, \( p = 0.04 \), higher in groups 1 and 2, respectively), and greater odds of meeting or exceeding the target ratio (28.4, \( p < 0.01 \), and 12.7, \( p = 0.02 \), in groups 1 and 2, respectively). Cost per caregiver reaching the target ratio was most favorable in Group 1 ($391 in Group 1, $527 in Group 2, and $1,666 in the control). Enhanced SBCC combined with increased oil ration resulted in increased use of oil in CSB porridge in a supplementary feeding program. Modified packaging did not improve effectiveness. However, both interventions were more cost-effective than standard programming.

**CITATION:** Rogers Beatrice; Wilner Lauren; Maganga Gray; W alton Shelley; Suri Devika; Langlois Breanne; Chui Ken, Boiteau, Jocelyn; Vosti Stephen; Webb Patrick. 2016. “Program Changes are Effective and Cost-effective in Increasing the Amount of Oil Used in Preparing Corn-Soy Blend Porridge for Treatment of Moderate Acute Malnutrition: An FAQR study in Malawi.” http://onlinelibrary.wiley.com/doi/10.1111/mcn.12393/full
The Role of Dairy in the Comparative Effectiveness and Cost of Fortified Blended Foods Versus Ready-to-Use Foods in Treatment of Children with Moderate Acute Malnutrition: A Narrative Review

AUTHORS: Devika Suri, Denish Moorthy, Irwin Rosenberg

DATE/JOURNAL PUBLISHED: 2016

THEMES: moderate acute malnutrition, lipid-based nutrient supplements, ready-to-use supplementary foods, fortified-blended foods, children younger than 5 years

ABSTRACT:

Background: Dairy is recommended in specially formulated supplementary foods to treat children with moderate acute malnutrition (MAM) but with limited evidence and added cost.

Objective: Review studies of ready-to-use foods (RUFs) versus fortified blended foods (FBFs) to determine whether inclusion of dairy modifies the comparative effectiveness and cost.

Methods: We reviewed literature comparing FBF and RUF in treatment of MAM among children younger than 5 years in developing countries. Outcomes of recovery from MAM, weight, and length gain were compared among treatment categories: FBF with dairy (FBF+), FBF without dairy (FBF-), RUF with dairy (RUF+), and RUF without dairy (RUF-). Supplement cost was compared per 500 kcal.

Results: Eight studies were included. Rations were heterogeneous in energy and type of dairy. Overall, FBF+, RUF+, and FBF- performed similarly, with higher recovery and weight gain compared with FBF-. RUF+ had higher recovery (in 5 of 6 comparisons), weight gain (4 of 4), and length gain (1 of 4) versus FBF-. The RUF+ had higher recovery (1 of 2) versus FBF+ with no other differences. The RUF- versus FBF+ had no differences (0 of 2). The RUF- had higher recovery (1 of 2), weight gain (2 of 2) versus FBF-. Four studies reported supplement costs, which averaged US$0.15 (FBF-), US$0.18 (FBF+), US$0.18 (RUF-), and US$0.37 (RUF+) per 500 kcal.

Conclusions: There is a consistent benefit of FBF that include dairy in treatment of children with MAM. Benefits of dairy in RUF require further investigation. Evidence from rigorous quantitative analysis of existing data, cost-effectiveness, and prospective trials will be essential in determining policy on treatment for children with MAM.

Preparation and Presentation of Corn-Soy Blend for Moderately Malnourished Children in Malawi

Authors: Beatrice Rogers, Patrick Webb, Jocelyn Boiteau, Breanne Langlois, Gray Maganga, Shelley Walton, Devika Suri

Date/Journal Published: July 2017

Themes: corn soy blend, food aid, fortified blended food, moderate acute malnutrition, social and behavior change communication, supplementary feeding

Abstract: Corn Soy Blend (CSB) porridge is commonly prepared with oil for treatment of moderate acute malnutrition (MAM). A recent review recommended that 30 g of oil be used with 100 g of CSB to increase energy density and micronutrient absorption. This study assessed the effectiveness and cost-effectiveness of program changes aimed at achieving that target oil:CSB ratio in prepared porridge. Caregivers of children in MAM supplementary feeding programs were assigned to three groups: a control group received monthly rations of 1 L oil, 8 kg CSB in bulk, and social and behavior change communication (SBCC); intervention groups received 2.6 L oil, 8 kg CSB provided either in bulk (Group 1) or four 2-kg packages with printed messages (Group 2), and enhanced SBCC emphasizing the target oil:CSB ratio. Compared to the control, both intervention groups had higher mean added oil per 100 g CSB (18 g, p < 0.01, and 13 g, p = 0.04, higher in groups 1 and 2, respectively), and greater odds of meeting or exceeding the target ratio (28.4, p < 0.01, and 12.7, p = 0.02, in groups 1 and 2, respectively). Cost per caregiver reaching the target ratio was most favorable in Group 1 ($391 in Group 1, $527 in Group 2, and $1,666 in the control). Enhanced SBCC combined with increased oil ration resulted in increased use of oil in CSB porridge in a supplementary feeding program. Modified packaging did not improve effectiveness. However, both interventions were more cost-effective than standard programming.

Citation: Rogers, Beatrice; Webb, Patrick; Boiteau, Jocelyn; Langlois, Breanne; Maganga, Gray; Walton, Shelley; Suri, Devika. “Preparation and Presentation of Corn-Soy Blend for Moderately Malnourished Children in Malawi.” Field Exchange, 55, July 2017. p. 26. www.ennonline.net/fex/55/csbmalawi
**Self-report vs. Direct Measures for Assessing Corn-Soy Blend Porridge Preparation and Feeding Behavior in a Moderate Acute Malnutrition Treatment Program in Southern Malawi**

**AUTHORS:** Breanne Langlois, Devika Suri, Lauren Wilner, Shelley Walton, Ken Chui, Kristine Caiafa, Beatrice Rogers

**DATE/JOURNAL PUBLISHED:** 2017

**THEMES:** Food aid, corn soy blend, supplementary feeding, moderate acute malnutrition, self-report, in-home observation, sharing, Malawi

**ABSTRACT:** This analysis assessed whether caregivers’ reports about the amount of oil added to corn soy blend (CSB) porridge were consistent with lab analysis and whether reported sharing of CSB porridge was consistent with direct observation. This was a secondary analysis of a feasibility study assessing 2 programmatic changes in a supplementary feeding program for treatment of moderate acute malnutrition (MAM) in southern Malawi. Intervention groups received standard monthly rations of CSB with increased oil along with social behavior change communication (SBCC) to increase the amount of oil added to CSB porridge and reduce sharing. A control group received the standard CSB and oil ration. Self-reported data collected through structured interviews with caregivers were compared with laboratory analysis of CSB porridge samples and in-home observation over a 5-day period. On average, participants overreported the amount of oil used in prepared CSB porridge; self-report tended to be closer than the lab-assessed values to the amount recommended in the SBCC. Self-reported and observed sharing appeared consistent across groups. Overall, the self-reported and direct measures showed the same relationships among the groups. Self-report and objective measures were inconsistent but conveyed the same overall message.

**CITATION:** Langlois, Breanne; Suri, Devika; Wilner, Lauren.; Walton, Shelley; Chui, Ken; Caiafa, Kristine; Rogers, Beatrice. (2017). "Self-report vs. Direct Measures for Assessing Corn-Soy Blend Porridge Preparation and Feeding Behavior in a Moderate Acute Malnutrition Treatment Program in Southern Malawi.” 1-12. doi:10.1080/19320248.2017.1374902
Effective Delivery of Social and Behavior Change Communication through a Care Group Model in a Supplementary Feeding Program

AUTHORS: Lauren Wilner, Devika Suri, Breanne Langlois, Shelley Walton, Beatrice Rogers

DATE/JOURNAL PUBLISHED: 2017

THEMES: Social and behavior change communication, Supplementary feeding, Moderate acute malnutrition, Food aid, Corn soy blend

ABSTRACT:

Background: In 2014, an intervention aimed at increasing the oil in corn soy blend (CSB) porridge prepared by caregivers of children with moderate acute malnutrition was implemented in Southern Malawi. This analysis describes the flow of key messages delivered through the Care Group model during this intervention.

Methods: The intervention provided a supplementary food ration of CSB and oil and used a Care Group model in which healthcare workers were trained to deliver social and behavior change communication (SBCC) to care group volunteers who then delivered messages to caregivers of beneficiary children. Healthcare workers also delivered messages to caregivers directly. Interviews and focus groups were conducted with all three groups in order to determine the exchange of key messages about ingredient use, storage, and purpose, which were analyzed descriptively.

Results: Analysis of SBCC flow and information exchange showed that 100% of caregivers reported learning about the amounts of oil and CSB to use while preparing porridge and over 90% of caregivers, healthcare workers, and care group volunteers reported talking about it. Focus groups confirmed an effective flow of communication among these three groups.

Conclusion: This analysis evaluated the flow of key SBCC messages through multiple, overlapping lines of communication among healthcare workers, care group volunteers, and caregivers; the effective transmission of these SBCC messages through this model may contribute to the success of a supplementary feeding intervention program.

Making Food Aid Fit-for-Purpose in the 21st Century: A Review of Recent Initiatives Improving the Nutritional Quality of Foods Used in Emergency and Development Programming

Authors: Patrick Webb, Kristine Caifa, Shelley Walton

Date/Journal Published: December 2017

Themes: food aid, humanitarian, food technology, nutrition, food assistance, evidence-based

Abstract: Important strides have been made recently in upgrading the global food aid agenda in line with evolving medical and nutrition sciences, operational experience, and innovations in food technology. A 2011 report endorsed by the United States Agency for International Development (USAID) recommended numerous improvements to products intended to support improved survival and nutrition in humanitarian programming, as well as greater rigor and transparency in the research agenda that supports innovations in this critical field. This article reviews progress since 2011 made by USAID, and other global food aid providers, in developing food aid products that are fit-for-purpose and are appropriately formulated to save lives in emergencies and to promote healthy mothers and children in nonemergency contexts. It highlights important modifications and additions made to products and identifies persisting knowledge gaps that should be prioritized in future research.

A review of research methods used to study specialised nutritious foods

**AUTHORS:** Kristine Caiafa, Maria Wrabel, Devika Suri, Ye Shen, Shelley Walton, Beatrice Lorge Rogers and Patrick Webb

**DATE/JOURNAL PUBLISHED:** April 2020

**ABSTRACT:** Specialised nutritious foods (SNFs), which include lipid-based nutrient supplements (LNSs), ready-to-use therapeutic foods (RUTFs), ready-to-use supplementary foods (RUSFs), fortified blended foods (FBFs), micronutrient powders (MNPs) and locally produced analogs of these products, are food products specially formulated to treat, prevent or mitigate undernutrition. Scientific research on SNFs has expanded rapidly in the past two decades, driven by an intent to improve nutrition outcomes. While much has been learned, global practice standards for using SNFs as a class remain elusive. The challenges inherent in studying these products and a lack of aggregate emphasis on study quality has generated an evidence base considered in recent reviews to be of low or moderate quality (Webb, 2015; Lazzerini et al, 2013; Schoonees, 2013).

An excellent model for how to move forward can be found in the methods used to develop standards for the management of acute malnutrition (WHO, 2013; WHO, 2012). These global policies were made possible by corralling a robust evidence base, largely through the use of systematic reviews. Similar evidence synthesis for SNFs would require high-quality studies; i.e., using designs that are appropriate to the research question and which mitigate risk of bias and threats to validity, and that are collectively similar enough in study characteristics so that findings are comparable. Research generalisability, or applicability to larger populations from which a study sample is drawn, is also critical to this type of evidence synthesis.

The aims of this review are threefold: first, to identify common methods used in a sample of SNF research; second, to highlight the methods that influenced quality, comparability and generalisability; and third, to propose actions for a stronger evidence base.

Food aid for nutrition: A landscape review of current research and implications for future studies

Authors: Maria Wrabel, Kristine Caiafa, Beatrice Lorge Rogers and Patrick Webb

Date/Journal Published: April 2020

Abstract: Advancements in the formulation of specialised nutritious foods (SNFs), including ready-to-use therapeutic foods (RUTFs) and fortified blended foods (FBFs), have revolutionised food aid. This has both derived from and led to an expanding evidence base on these products. In 2011, a review of the United States Government’s food-aid agenda undertaken by the Food Aid Quality Review (FAQR) on behalf of the United States Agency for International Development Office of Food for Peace (USAID/FFP) (Webb et al, 2011) called for new rigorous research activities to investigate the programming, cost-effectiveness and innovative formulations of SNFs in the context of wider food-assistance strategies. More recently, other entities, including the No Wasted Lives Coalition and the Scaling Up Nutrition movement (SUN), have unveiled research agendas calling for more evidence on key topics, from the role of specific nutrients in preventing and treating undernutrition to intergenerational undernutrition and alternative outcome measures (Webb et al, 2017; Caiafa et al, 2017; Walton et al, 2018). To support these demands for policy-relevant evidence, the current review synthesises published and ongoing research conducted from 2011 until July 2018 to identify common themes and map areas for further exploration.

Citation: Caiafa, Kristine, Maria Wrabel, Devika Suri, Ye Shen, Shelley Walton, Beatrice Lorge Rogers, and Patrick Webb. A review of research methods used to study specialised nutritious foods. Field Exchange 62 (April 2020): 41-43. www.ennonline.net/fex/62/specialisednutritiousfoods
Factors that May Influence the Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso


DATE/JOURNAL PUBLISHED: February 2020

THEMES: supplementary feeding, children under 5, corn–soy blend, lipid-based nutrient supplements, stunting, wasting, specialized nutritious food, Burkina Faso

ABSTRACT:

Background: A trial in Burkina Faso compared the cost-effectiveness of 4 specialized nutritious foods (SNFs) used to prevent stunting and wasting in children aged 6–23 mo.

Objectives: This article explores differences in SNF use that may have influenced effectiveness, specifically in relation to consumption by the recipient child and by any other person (i.e., sharing), other diversion from the recipient child, preparation, storage, and hygiene.

Methods: Subsamples from a geographically clustered, longitudinal trial with random assignment to Corn Soy Blend Plus with oil (CSB+ w/oil), Corn Soy Whey Blend with oil (CSWB w/oil), Super Cereal Plus (SC+), or ready-to-use supplementary food (RUSF) were selected for in-depth interviews, in-home observations, and focus group discussions.

Results: Sharing was common in all arms, with the highest reported in SC+ (73%) and highest observed in CSWB w/oil (36%). Some reported giving the ration away (highest in SC+ at 17%) or using it for other purposes (highest in CSWB w/oil at 17%). The recipient child was observed consuming the ration in 49% of households on average (38–60% by arm in CSB+ w/oil and RUSF, respectively). Qualitative reports of bitterness and spoilage emerged in the CSWB w/oil arm.

Conclusions: The SNFs were not prepared or served as intended and diversion from the recipient was common. Storage conditions may have resulted in spoilage of the ration containing whey before reaching recipients. This article provides context about factors that may have influenced the effectiveness of these SNFs. Programming and household use of SNFs are as important as their nutrient composition. This trial was registered at clinicaltrials.gov as NCT02071563.

Cost-Effectiveness of 4 Specialized Nutritious Foods in the Prevention of Stunting and Wasting in Children Aged 6–23 Months in Burkina Faso: A Geographically Randomized Trial


DATE/JOURNAL PUBLISHED: February 2020

ABSTRACT:

Background: There is a variety of specialized nutritious foods available for use in programs targeting undernutrition, but evidence supporting the choice of product is limited.

Objectives: We compared the cost-effectiveness of 4 specialized nutritious foods to prevent stunting and wasting in children aged 6–23 mo in Burkina Faso.

Methods: Four geographic regions were randomly assigned to 1 of 4 intervention arms: Corn-Soy Blend Plus (CSB+) programmed with separate fortified vegetable oil (the reference food), Corn-Soy-Whey Blend (CSWB; a new formulation) with oil, SuperCereal Plus (SC+), and ready-to-use supplementary food (RUSF). We compared the effects of each intervention arm on growth (length-for-age z score (LAZ), weight-for-length z score (WLZ), end-line stunting (LAZ < −2), and total monthly measurements of wasting (WLZ < −2). Rations were ∼500 kcal/d, distributed monthly. Children were enrolled in the blanket supplementary feeding program at age ∼6 mo and measured monthly for ∼18 mo. Average costs per child reached were linked with effectiveness to compare the cost-effectiveness of each arm with CSB+ with oil.

Results: In our sample of 6112 children (CSB+, n = 1519; CSWB, n = 1503; SC+, n = 1564; RUSF, n = 1526), none of the foods prevented declines in growth. Children in the SC+ and RUSF arms were not significantly different than those in the CSB+ with oil arm. Children in the CSWB with oil arm experienced higher end-line (measurement at age 22.9–23.9 mo) stunting (OR: 2.07; 95% CI: 1.46, 2.94) and more months of wasting (incidence rate ratio: 1.29; 95% CI: 1.09, 1.51). CSB+ with oil was the least-expensive ration in all costing scenarios ($113–131 2018 US dollars/enrolled child) and similar in effectiveness to SC+ and RUSF, and thus the most cost-effective product for the defined purposes.

Conclusions: CSB+ with oil was the most cost-effective ration in the prevention of wasting and stunting in this trial. This trial was registered at clinicaltrials.gov as NCT02071563

Impact of stakeholder perspectives on cost-effectiveness estimates of four specialized nutritious foods for preventing stunting and wasting in children 6–23 months in Burkina Faso

AUTHORS: Ye Shen, Ilana R. Cliffer, Devika J. Suri, Breanne K. Langlois, Stephen A. Vosti, Patrick Web, and Beatrice L. Rogers

DATE/JOURNAL PUBLISHED: February 2020

ABSTRACT:

Background: Multiple specialized nutritious food options are programmed for supplementation in humanitarian and development settings. However, comparative cost-effectiveness evidence is lacking, let alone incorporation of perspectives from uncompensated stakeholders. A Burkina Faso trial evaluated the cost-effectiveness of Corn Soy Blend Plus w/oil (CSB+ w/oil, reference arm), Corn Soy Whey Blend w/oil (CSWB w/oil), Super Cereal Plus (SC+), and Ready-to-Use Supplementary Food (RUSF) in reducing stunting and wasting among children 6–23 months old. This paper presents cost-effectiveness findings from multiple stakeholders’ perspectives, including caregivers and program volunteers.

Methods: An activity-based costing with ingredients approach was used to summarize cost of the 18-month-long blanket supplementary feeding for each enrolled child (in 2018 USD). Time data were collected using self-reported and observational instruments. Cost-effectiveness relative to CSB+ w/oil assessed incremental cost per enrolled child against incremental outcomes: prevalence of stunting at 23 months of age and number of months of wasting. Two combined perspectives were compared: program (donor, implementer, and volunteer) versus program and caregiver (adding caregiver).

Results: A total of 6112 children were enrolled. While similar effectiveness was found in three arms (CSWB w/oil was less effective), costs differed. Product cost and caregiver time to prepare study foods were major drivers of cross-arm cost differences from the respective combined perspective. The two major drivers were used to construct uncertainty ranges of cost per enrolled child from program and caregiver perspective: $317 ($279–$355) in CSB+ w/oil, $350 ($327–$373) in CSWB w/oil, $387 ($371–$403) in RUSF, and $434 ($365–$503) in SC+. Cost from program and caregiver perspective was a substantial increase from program perspective. CSB+ w/oil was most cost-effective in reducing stunting and wasting, and this main finding was robust to changing perspectives and all corresponding sensitivity analyses when uncompensated time was valued at minimum wage ($0.36/h). The break-even point for uncompensated time valuation is >$0.84/h, where RUSF became the most cost-effective from the program and caregiver perspective. Relative cost-effectiveness rankings among the other three arms depended on choice of perspectives, and were sensitive to values assigned to product cost, international freight cost, opportunity cost of time, and outcomes of a hypothetical control. Volunteer opportunity cost did not affect arm comparisons, but lack of compensation resulted in negative financial consequences for caregivers.

Conclusions: Evaluating cost-effectiveness by incorporating uncompensated stakeholders provided crucial implementation insights around nutrition products and programming.

Fortified blended flour supplements displace plain cereals in feeding of young children

AUTHORS: Ilana R. Cliffer, William A. Masters, and Beatrice L. Rogers

DATE/JOURNAL PUBLISHED: September 2020

THEMES: Burkina Faso, complementary feeding, displacement, fortified food, infants and young children, substitution, supplementary feeding

ABSTRACT:
Lipid-based nutritional supplements (LNS) and fortified blended flours (FBF) are widely used to increase the nutrient density of children's diets and improve their health, but their effectiveness could be modified by displacement of other foods. We reanalysed data from a cost-effectiveness trial comparing impacts on anthropometry of three FBFs (Corn Soy Blend Plus [CSB+], Corn Soy Whey Blend [CSWB], SuperCereal Plus [SC+]) and one LNS (Ready-to-use Supplementary Food [RUSF]) among infants aged 7–23 months in Burkina Faso. Using dietary diversity data from a single 24-h recall period (n = 1,591 children, observed once over 18-month study period), we fit logistic regression models to estimate differences in intake of each food group making up the infant and young child minimum dietary diversity score and linear models to test for differences in dietary diversity score among children in each supplement arm. We tested for differences in breastfeeding time using the subsample for which breastfeeding was observed (n = 176). Children who consumed one of the three FBFs had lower odds of consuming household grains, roots and tubers compared with the LNS consumers (odds ratios [ORs] = 0.35 – 0.47; 95% confidence intervals [CIs]: 0.20 – 1.05). Consumption of other foods, dietary diversity and breastfeeding did not differ significantly at the 5% significance level. FBFs displaced the household's own cereals more than LNS, with no difference in the child's consumption of other more nutrient-rich family foods. Given limited stomach capacity and feeding time, providing fortified cereals may help improve children's overall diet quality in settings where children would otherwise be fed nutrient-poor root crops or cereal grains.

Improvements to the USAID/FFP Food Basket: Product Upgrades and Innovations, Processes for Modifying the Food Basket and Communications with Partners

Proposed Method for Assessing Packaging Options for Food Aid Products: The Case of Fortified Vegetable Oil

Food Aid Packaging Challenges and Opportunities: A Review of the Packaging for Fortified Vegetable Oil, Corn-Soy Blend Plus and Super Cereal Plus

Food matrices: A Review of Critical Factors Impacting Nutritional Bioavailability

Enhancing the Nutrient Bioavailability of Food Aid Products

Effect of Cooking Methods and Formulation of Fortified Blended Foods on the Food Matrix and Nutrient Bioavailability: An Experiment from The Food Aid Quality Review, Sierra Leone Four Foods Study

USAID Food for Peace Food Safety & Quality Assurance Feedback Loop Analysis

USAID/FFP Food Safety & Quality Assurance Feedback Loop: A Proposed Questionnaire and Database for Collection of Food Aid Quality Incidents

The Last Mile of Food Aid Distribution: Insights Gained through FAQR’s Field Studies in Malawi, Burkina Faso and Sierra Leone

Comparative Cost-Effectiveness of Four Supplementary Foods in Preventing Stunting and Wasting in Children 6-24 Months in Burkina Faso

Current State of Evidence: Advancing Food Assistance for Nutrition Programming


Feasibility and Acceptability Study of Preparing Corn Soy Blend with Fortified Vegetable Oil in Malawi

Introduction of New and Improved Food Aid Products, 2011-2015: Lessons Learned and Recommendations

Cooking Instruction Development and Acceptability Tests of Corn-Soy Blend Porridges: Pujehun District, Sierra Leone

Maximizing Food Aid Supply Chain Cost Effectiveness: A Report from the Food Aid Quality Review Workshop at the 2017 Health and Humanitarian Logistics Conference

Food for Peace Commodities Resource Portal: A Landscape Analysis
**EXECUTIVE SUMMARY:**

**Why FAQR Undertook This Activity:**

The Food Aid Quality Review (FAQR) is a partner of United States Agency for International Development Office of Food for Peace (USAID/FFP), which seeks to support the agency with actionable recommendations for improving food aid products, programs, and processes. Under contract AID-OAA-C-16-00020, USAID/FFP tasked FAQR with recommending updates and potential improvements to the mix of products available for procurement and use in USAID/FFP programs often called the “food basket”. The USAID/FFP food aid programs benefit millions of people around the world, and the aid environment of high demand and limited funding necessitates that the products used are as efficient as possible. Thus, the food basket should contain a diverse range of cost-effective products suited to meet the nutritional needs of recipients, and these products should be programmed as intended.

**Conclusions:**

FAQR identified a) upgrades that USAID/FFP can make to existing products, b) cutting-edge research on product formulation and nutrition science, and updates to food standards that should guide product development, c) a process for incorporating additional products into the food basket, and d) strategies for communicating food basket updates and changes to partners.

**Access:**

[Access](https://foodaidquality.org/sites/default/files/publications/IMPROVEMENTS%20TO%20THE%20USAIDFFP%20FOOD%20BASKET%20FINAL%20for%20FFP%2031%20Jan%202019_DEC%20updated%205.19.19.pdf)

**Citation:** Caiafa, Kristine; Shelley Walton, Beatrice Lorge Rogers, and Patrick Webb. “Improvements to the USAID/FFP Food Basket: Product Upgrades and Innovations, Processes for Modifying the Food Basket and Communications with Partners.” Report to USAID. (2019) Boston, MA: Tufts University.
Proposed Method for Assessing Packaging Options for Food Aid Products: The Case of Fortified Vegetable Oil

Authors: Agathe Roubert, Quentin Johnson, Shelley Walton, and Patrick Webb

Date Published: November 2018

Executive Summary:
As an input to USAID’s ongoing food aid packaging dialogue with stakeholders on appropriate ways to move forward, this report proposes a comprehensive method to compare packaging options based on their cost-effectiveness. The approach includes an assessment of costs, performance and functionality, and proposes a grading system to identify the most cost-effective option: the packaging technology that best optimizes these three criteria. The approach was tested on the case of Fortified Vegetable Oil (VO). VO is among the main value-added food aid products donated by USAID for both development and emergency programs. In FY 2017, USAID procured 84,092 MT of VO for Title II programs, mostly packaged in four-liter tins (1). However, feedback from field-based partners indicates that this packaging does not provide the performance and functionality needed to ensure that VO reaches food aid recipients efficiently (2). It is estimated that 1 to 2 percent of procured VO are lost, or about $1.5 million (3), while up to 10 percent need to be reconditioned (transferred to new packaging to prevent losses due to damage to the original packaging), which could cost an additional $2.5 million1,2 (U.S. dollars). Six different types of packaging were evaluated: three different cylindrical tin cans with a plug similar to the closure currently being used, one cylindrical tin can with a plain top without a plug, one rectangular (F-style) tin can with a pullout spout and one plastic (polyethylene terephthalate or PET) bottle. A cost comparison was conducted to assess the impact that packaging would have on operations, packaging, ocean freight, inland transport and storage costs. The total cost of the six packaging options was compared to the estimated average total cost of VO in its current packaging. The performance of the six different packaging options was then evaluated via laboratory testing and functionality was assessed based on handleability, distribution practicality, usage practicality, food safety, packaging reusability and packaging waste generation. The cost, performance and functionality of each packaging option were graded and a cost-effectiveness score was generated. The method proved effective at discriminating packaging options based on their cost-effectiveness and provides a framework to decisionmakers to guarantee that a comprehensive approach is taken when packaging options are evaluated. Moving forward, additional packaging options should be tested following the same method.


Citation: Roubert, Agathe; Johnson, Quentin; Walton, Shelley; Webb, Patrick. 2018. Proposed Method for Assessing Packaging Options for Food Aid Products: The Case of Fortified Vegetable Oil. Report to USAID. Boston, MA: Tufts University.
EXECUTIVE SUMMARY:
In Fiscal Year 2017 (FY 2017) alone, the United States Agency for International Development (USAID) Office of Food for Peace (FFP) provided over 3 million metric tons (MT) of in-kind food aid as part of the global effort to fight hunger and malnutrition (1). However, despite this and other successes, for some time implementing partners and other stakeholders along the food aid supply chain have been reporting challenges related to food aid packaging that may lead to food losses and system inefficiencies. Based on field observations and feedback from implementing partners, losses estimates are typically around 1 percent of total food aid products, which could translate in over US $ 1 million lost every year. Therefore, a food aid packaging review was included in the 2016 scope of work for the Food Aid Quality Review (FAQR) project. This report summarizes top-order challenges linked to the current packaging of three high-value foods — Fortified Vegetable Oil (VO), Corn Soy Blend Plus (CSB+) and Super Cereal Plus (SC+) — and explores potential options for future enhancements. Packaging plays a key role in both ensuring that the foods arrive to the food aid recipients and in maintaining food quality throughout the entire supply chain. But stakeholder feedback revealed problems with the type and size of packaging and concerns over the ability to protect and deliver food as required. Any food losses, quality deterioration, and delays or logistic complications have financial consequences.


**Executive Summary:**

The bioavailability of nutrients from foods (how the foods get converted and used in the body) forms the crux of ‘‘nutritional efficiency.’’ This is important when using food products to address issues associated with malnutrition. Food aid products are designed to provide defined amounts of energy and essential nutrients (in optimal forms) to undernourished populations in developing economies. It is therefore vital for product design to keep up with science and food technology where potential gains in nutrient bioavailability are concerned. Efforts to improve the bioavailability of food aid products could potentially offer enhanced efficacy and cost-effectiveness. This report reviews the existing published and gray literature to determine possible opportunities for improvements to existing products. The review considers ingredients as well as production processes which have some potential to unlock nutrient availability to undernourished consumers. The review finds various elements which affect the food matrix and thus the bioavailability of nutrients. These factors can be majorly divided into: i) ingredients; and ii) processing. The primary reason or the most common reason attributed to the factor affecting nutrient bioavailability is the presence of phytate and other antinutritional factors in the cereals and legumes which constitute a considerable share of food aid product portfolio. The antinutritional factors are present in raw as well as processed foods. The other factors related to ingredients which influence the food matrix and therefore influence nutrient bioavailability from food aid products are: protein quality, shelf life, micronutrient forms and nutrient interactions. For example, processing impacts and modifies the food matrix and milling removes most antinutritional factors present in grains and legumes. Extrusion processing increases the starch digestibility and contributes in preparing a less sticky porridge which has better chances of nutrient bioavailability. Additionally, there is a need to quantify and correlate the bioavailability of nutrients from food aid products in terms of in vitro and in vivo tests to present a cost-effective prediction of bioavailability from the different preparations of food aid products. Some non-food factors related to health and sanitation of the recipients of food aid was also found to play a critical role in nutrient absorption from the food matrices. Further interaction with food aid industry stakeholders, commercial food technologies and operationally-informed nutritionists is warranted to discuss and prioritize options with a view to their adoption to enhance USAID’s evolving food aid product portfolio.

**Access:** [https://pdf.usaid.gov/pdf_docs/PA00TRDW.pdf](https://pdf.usaid.gov/pdf_docs/PA00TRDW.pdf)

**Citation:** Joseph, Michael; Alavi, Sajid; Johnson, Quentin; Walton, Shelley; Webb, Patrick. 2018. Food matrices: A Review of Critical Factors Impacting Nutritional Bioavailability. Report to USAID. Boston, MA: Tufts University.
Executive Summary:
Food aid products designed to achieve nutrition goals remained largely unchanged over many years until the publication of a 2011 report called Improving the Nutritional Quality of U.S. Food Aid: Recommendations for Changes to Products and Programs. That report made numerous recommendations relating to specialized food aid products, most of which have been put into use. In a second phase of work, it was decided that a new focus on nutrient bioavailability was needed. This report presents findings and recommendations in the nutrient bioavailability domain. It includes a literature review to understand current thinking on nutrient bioavailability through a food matrix lens. In addition, it includes feedback from consultations with experts and meetings with stakeholders on practical aspects of improving the food aid products’ nutrient bioavailability. Food aid products are formulated with the objective of treating or preventing different forms of undernutrition but studies which examine foods’ nutrient bioavailability as a contributing factor to the overall health outcome have rarely been investigated. This report, which is part of work under the Food Aid Quality Review (FAQR) project funded by USAID’s Office of Food for Peace (FFP), is to review the role science plays in food matrices by impacting the nutrient bioavailability. This report explores the different components of the food matrix’s specialized nutritious food aid products and considers its effects on the nutrients consumed. The goal is to identify areas of improvements. A snapshot of challenges and recommendations is provided to the right.

Access:
https://foodaidquality.org/sites/default/files/uploads/Enhancing%20the%20Nutrient%20Bioavailability%20of%20Food%20Aid%20Products%20%28FINAL%20for%20FFP%29%20Jan%202019_updated%20version.pdf

Citation: Joseph, Michael; Alavi, Sajid; Johnson, Quentin; Walton, Shelley; Webb, Patrick. 2019. Enhancing the Nutrient Bioavailability of Food Aid Products. Report to USAID. Boston, MA: Tufts University.
Effect of Cooking Methods and Formulation of Fortified Blended Foods on the Food Matrix and Nutrient Bioavailability: An Experiment from The Food Aid Quality Review, Sierra Leone Four Foods Study

AUTHORS: Michael Joseph, Stacy Griswold, Sajid Alavi, Lindsey Green, Quentin Johnson, Shelley Walton, and Patrick Webb

DATE PUBLISHED: 2019

EXECUTIVE SUMMARY:
Understanding the role of food matrices and nutrient bioavailability in food aid products is important to assure that the products are efficient in providing the maximum possible nutritional benefit to recipients. In order to explore the role of food matrices on the health outcomes of food aid recipients, three isocaloric fortified blended foods (FBFs) being used in the Food Aid Quality Review (FAQR) field study in Sierra Leone were tested for differences in food matrices, measured by formulation and viscosity of porridges, when prepared by the caregivers of study participants. The Sierra Leone Treatment of Moderate Acute Malnutrition (MAM) Four Foods study was designed to determine the relative effectiveness and cost effectiveness of four supplementary foods in the treatment of MAM in children ages 6 to 59 months. Three FBFs are being studied: Corn Soy Whey Blend (CSWB) and Corn Soy Blend Plus (CSB+), both prepared with fortified vegetable oil (oil) and Super Cereal Plus with amylase (SC+A). Standardized preparation methods for the porridges, developed from field observations, were replicated in laboratory settings to collect data on the changes in the viscosity of the porridge that occurred during cooking. When cooked, CSB+ and CSWB were more viscous than SC+A due to differences in formulation. The higher viscosities lead to thicker porridges. The thicker porridges are harder to consume or sip out of a cup, leave more residue in the cup and provide a satiated feel for a longer period of time. All of this predisposes the children in the CSB+ and CSWB groups to ingest less of these porridges and/or other foods that they will normally consume during the course of the study. On the other hand, caregivers might dilute these thick porridges by adding more water than recommended during cooking in order to make them thinner, which in turn will reduce the concentration of nutrients that can be consumed by the children in one serving. This too will have an unintended negative impact on the outcomes. Also review of the formulation of the FBFs indicated that the inclusion of dairy proteins in CSWB and SC+A may improve linear growth, compared to CSB+. These two FBFs also have twice the level of micronutrients as compared to CSB+. Access:

CITATION: Joseph, Michael; Griswold, Stacy; Alavi, Sajid; Green, Lindsey; Johnson, Quentin; Walton, Shelley; Webb, Patrick. 2019. Effect of Cooking Methods and Formulation of Fortified Blended Foods on the Food Matrix and Nutrient Bioavailability: An Experiment from The Food Aid Quality Review, Sierra Leone Four Foods Study. Report to USAID. Boston, MA: Tufts University.
USAID Food for Peace Food Safety & Quality Assurance Feedback Loop Analysis

AUTHORS: Nina Schlossman, Mandy Bridges, and Quentin Johnson

DATE PUBLISHED: November 2018

EXECUTIVE SUMMARY:
In 2017, approximately $2.9 billion was spent on 3.1 million metric tons of international food aid by the United States Agency for International Development (USAID) Office of Food for Peace (FFP) to support global emergency and development activities, and international food assistance programming in 53 countries. The food aid supply chain is long and often harsh on products. Maintaining safety and high quality of products throughout is paramount and historically has been done effectively. USAID is focusing on making its food safety and quality assurance (FSQA) measures even more effective as part of its food aid quality improvement activities.

FSQA controls in place during production ensure that food and ingredients are safe (handled hygienically, securely packaged, and free of microbes, pests and defects) and of high quality (appearance, taste, and flavor) as part of food safety regulations for manufacturers in the United States (U.S.) and abroad. To meet these standards, food production facilities are required to have systems in place throughout the production and manufacturing process, such as, Good Manufacturing Practices (GMP) and Hazard Analysis Critical Point (HACCP) plans, to ensure that safe food reaches consumers. FSQA Feedback Loops are an essential tool to report and address incidents that may arise anywhere along the supply chain: from the producers and suppliers, to the consumers/end users, and back to U.S. Government Agencies. While incidents are rare, the information generated and how they are resolved become part of the evidence base and promote the continuous improvement of products and systems.

This report reviews FSQA systems already in place to inform FFP’s efforts to improve the FSQA system in the food aid supply chain. A detailed analysis of six FSQA feedback loop systems was conducted through a desk review and 20 key informant interviews as part of a broader activity to review, recommend, and modernize systems for commodity users based on evidence and findings. These Feedback Loops include those currently used by USAID/FFP, the U.S. Department of Agriculture (USDA), World Food Programme (WFP), and the U.S. commercial food Industry. Ease of use, timeliness, questionnaire and data type, data and trend analysis, storage, reporting threshold (U.S. dollar amount), and staff requirements were among the criteria used to evaluate each system.

The analysis found that once food aid products are no longer under USAID title, often once international food aid products leave manufacturing plants, control is lost over feedback. How products perform throughout the rest of the supply chain is largely unknown due to the lack of information gathered in-country and reported back to USAID. The current USAID/FFP FSQA feedback system and its accompanying questionnaire are underutilized and inefficient without a database of stored data. There is little evidence to drive continuous improvement of the food aid supply chain or provide relevant feedback on vulnerable points along the supply chain.
The findings from this assessment indicate the need for a modern, streamlined, and easily accessible Feedback Loop using a simple, multiplatform tool and questionnaire to capture and transmit the data. A simple tool for reporting incidents along the supply chain is an important element to include in the FSQA system. The proposed Feedback Loop would have a low reporting threshold ($1), ability to collect and store data, allow for quick transmission of information pertaining to FSQA incidents, have an established workflow by type of incident leading to prompt resolution, involve one dedicated staff member to manage the system, and be user-friendly without stigma or ill-consequences for reporting incidents. It is recommended that USAID/FFP adopt a simpler FSQA Feedback Loop with a Food Incident and Quality Questionnaire (FIQQ) and pilot test the system with a couple of food aid products. Eventually a simplified feedback loop should be embedded in the commodity management system currently used for procurement and distribution of US food aid commodities in emergency and nonemergency settings.

**Access:**

**Citation:** Schlossman, Nina; Bridges, Mandy; Johnson, Quentin. 2018. USAID Food for Peace Food Safety & Quality Assurance Feedback Loop Analysis. Report to USAID. Boston, MA: Tufts University.
USAID/FFP Food Safety & Quality Assurance Feedback Loop: A Proposed Questionnaire and Database for Collection of Food Aid Quality Incidents

AUTHORS: The Food Aid Quality Review Project

DATE PUBLISHED: 2019

OVERVIEW:
Food Safety and Quality Assurance (FSQA) is a priority for the United States Agency for International Development (USAID)/Office of Food for Peace (FFP) as it continues to improve its food aid supply chain. In recent years U.S. Agencies have made great progress in optimizing food safety and quality across the food aid supply chain. This has included application of new technologies and innovations (e.g. introducing barcoding for domestic programs and exploring blockchain technology1 ). Efforts to advance this domain are critical to impact the way food safety and quality issues in international food aid are handled and support the transition to a proactive and preventive approach to FSQA. While FSQA incidents are rare in the international food aid supply chain they currently go underreported. The supply chain is lengthy and incidents may take place at the far end when it is too late to determine where the incident initiated. There is a need for a more streamlined feedback system starting with efficient reporting mechanisms. The Food Aid Quality Review (FAQR) Phase III team reviewed several FSQA feedback loop systems2 to identify best practices and determine if they would be effective for the international food aid supply chain. The main recommendations were for:

1) A simplified questionnaire and database to report, store, analyze, resolve and trend FSQA incident with no stigma to the reporting entity.
2) A dedicated minimum amount of personnel time to manage the system.
3) A system in alignment with already operational FSQA feedback systems for U.S. Government food assistance and distribution programs.

As a result, the FAQR team developed an updated Food Incident and Quality Questionnaire (FIQQ), and a corresponding FIQQ Feedback Spreadsheet for automatic data collection and storage, which was then vetted with stakeholders. The FIQQ and Feedback Spreadsheet promote timely identification of issues and incidents and together, create a mechanism for the aggregation and storage of data, including photographs. It is a simple, multi-platform system ready to be pilot tested. This report describes the process for developing the FQQ and Spreadsheet and provides a method for further piloting.


The Last Mile of Food Aid Distribution: Insights Gained through FAQR’s Field Studies in Malawi, Burkina Faso and Sierra Leone

AUTHORS: Agathe Roubert, Ilana Cliffer, Stacy Griswold, Ye Shen, Devika Suri, Breanne Langlois, Gray Maganga, Shelley Walton, Beatrice Rogers, and Patrick Webb

DATE PUBLISHED: November 2018

EXECUTIVE SUMMARY:
In Fiscal Year (FY) 2017, through its food assistance programs, the United States Agency for International Development (USAID)/Office of Food For Peace (FFP) reached 70 million people in 53 countries as part of the global effort to fight hunger and malnutrition. This included shipping over 1.4 million metric tons (MT) of food aid products from the United States to vulnerable populations across the globe. In these programs, the foods must go through a complex journey to reach end recipients. They are usually shipped by ocean freight and brought by truck to a main warehouse in the receiving country. This process takes several months, and even once the foods arrive in-country, significant challenges can arise before the foods reach the end recipients’ homes. Indeed, the “last mile,” defined as the section of the food aid supply chain between receipt of the foods by the implementing partner and storage at the recipients’ homes, is often a source of major bottlenecks for food aid stakeholders. The difficulties linked to environmental conditions, geography, and the available infrastructure and resources can negatively affect the efficiency and even the impact of food aid programs. Donors and decision-makers often lack contextually appropriate insights to understand some of these difficulties, and in-country organizations and volunteers must often find context-specific strategies to adapt to the difficulties they face. Last mile scenarios vary greatly among food aid programs, and there is no uniform solution to common problems. However, a better overall understanding of the last mile can help to improve the design, efficiency, and cost-effectiveness of food aid programs. This report contributes to last mile knowledge-building by drawing on experience from the Food Aid Quality Review (FAQR) Project’s field studies conducted on USAID/FFP Title II Development Food Security Activities (DFSA) in Southern Malawi and Northeastern Burkina Faso, as well as a Supplementary Feeding Program in Southern Sierra Leone. Through observations, interviews, and focus groups, the FAQR team collected feedback from food aid recipients, volunteers, and implementing partners on the challenges they face and strategies they have implemented to move foods through the last mile.


CITATION: Roubert, Agathe; Cliffer, Ilana; Griswold, Stacy; Shen, Ye; Suri, Devika; Langlois, Breanne; Maganga, Gray; Walton, Shelley; Rogers, Beatrice; Webb, Patrick. 2018. The Last Mile of Food Aid Distribution: Insights Gained through FAQR’s Field Studies in Malawi, Burkina Faso and Sierra Leone. Report to USAID. Boston, MA: Tufts University.
Comparative Cost-Effectiveness of Four Supplementary Foods in Preventing Stunting and Wasting in Children 6-24 Months in Burkina Faso

Authors: Ilana Cliffer, Devika Suri, Breanne Langlois, Ye Shen, Laetitia Nikiema Ouedraogo, Augustin Zeba, Hermann Lanou, Franck Garanet, Stephen Vosti, Shelley Walton, Lindsey Ellis Green, Kenneth Chui, Irwin Rosenberg, Patrick Webb, and Beatrice Rogers

Date Published: January 2019

Executive Summary:
In 2009, the United States Agency for International Development (USAID) Office of Food for Peace (FFP) tasked the Tufts University Friedman School of Nutrition Science and Policy with reviewing the science behind the nutritional needs of vulnerable populations and making recommendations on how to improve the quality and efficiency of USAID food aid programs for nutrition. The result was a report recommending modifications to the product considered the current standard for USAID, Corn Soy Blend Plus (CSB+). The goal of the changes to CSB+ was to improve the cost-effectiveness of the product by increasing its caloric density and improving its micronutrient content without unduly increasing its cost. In addition, the importance of animal source foods for growth in children was highlighted in the report; thus, it was recommended that the CSB+ be updated with the addition of a dairy ingredient. From July 2014 to December 2016, the Food Aid Quality Review (FAQR) team at Tufts University partnered with the Institut de Recherche en Sciences de la Santé (IRSS) in Burkina Faso to collect data to test the cost-effectiveness of the improved food, called Corn Soy Whey Blend (CSWB), compared with food most commonly used in USAID nutrition programs, CSB+; the World Food Programme (WFP) recommended food, Super Cereal Plus (SC+); and a lipid-based nutrient supplement, Ready-to-Use Supplementary Food (RUSF). The CSB+ and CSWB were delivered with Fortified Vegetable Oil (FVO), and caregivers were instructed to add 30 g of FVO to 100 g of dry flour when preparing porridge out of the flour. The three primary objectives of the study were:

1. Evaluate the comparative effectiveness of four food aid products in preventing stunting and wasting.
2. Determine the comparative cost-effectiveness of the four foods.
3. Identify factors influencing the effectiveness of the four foods.


Citation: Cliffer, Ilana; Suri, Devika; Langlois, Breanne; Shen, Ye; Ouedraogo, Laetitia Nikiema; Zeba, Augustin; Lanou, Hermann; Garanet, Franck; Vosti, Stephen; Walton, Shelley, Green, Lindsey Ellis; Chui, Kenneth; Rosenberg, Irwin; Webb, Patrick; Rogers, Beatrice. 2019. Comparative Cost-Effectiveness of Four Supplementary Foods in Preventing Stunting and Wasting in Children 6-24 Months in Burkina Faso. Report to USAID. Boston, MA: Tufts University.
EXECUTIVE SUMMARY: In an effort to support the Sustainable Development Goal of Zero Hunger and the Global Food Security Act aimed at reducing global hunger and improving nutrition, the following actions should be prioritized:

1. More funding is required for careful studies that document best practice for food assistance in all humanitarian contexts, with particular attention to measurable impacts on maternal and child nutrition.

2. Innovations should be promoted in product formulations, food packaging technology, food safety quality, and food aid supply chain optimization tools.

3. Multi-sectoral and multi-institutional collaboration and communication must be enhanced. No one donor, government or agency can effectively operate alone.

4. Investments should increase in advanced data systems to capture reliable and comprehensive food assistance trends.

5. Metrics of nutritional status need to go beyond physical growth of children to include brain development, gut health, and body composition to provide a physiological understanding of malnutrition.


Beyond Z-scores: Measures to Advance Prevention and Treatment Outcomes in Child Malnutrition.
Summary of Proceedings from a Symposium at the International Congress of Nutrition, Buenos Aires, Argentina on October 16, 2017

AUTHORS: Devika Suri, Irwin Rosenberg

DATE PUBLISHED: August 2018

EXECUTIVE SUMMARY: There is a growing imperative to measure the nutrition and health impact of food-based humanitarian assistance with more precision to better inform policy and practice. For many decades, researchers and programmers have relied mainly on anthropometric Z-scores and related cutoffs to determine the nutritional status of children to assess the impact of interventions. However, Z-scores may fail to distinguish important physiological or cognitive factors which can bias the interpretation of health, malnutrition or recovery. A symposium was organized at the 2017 International Congress of Nutrition (ICN) in Buenos Aires, Argentina, to consider three measures which add important contextual information and have implications for how we approach the treatment and prevention of child malnutrition. This paper provides a summary of the Symposium and key messages on research priorities, policy implications and programming guidance.

Several experts were asked to offer their perspectives on each of the three measures considered. The first measure was body composition, i.e. the proportion of lean and fat mass, which can be more useful than weight or height in predicting certain health outcomes. The second measure was environmental enteric dysfunction (EED), whose presence has been shown to be a predictor of child undernutrition. The third measure was dietary protein quality combined with biomarker serum amino acids, which have been shown to be associated with child malnutrition. Current research is being conducted on the use and interpretation of these three measures in the context of malnutrition. However, similar challenges remain among all three. The technology required to evaluate these three measures remains costly and highly-trained technicians are needed. In addition, there is ongoing debate as to which evaluation methods are the most accurate and meaningful. Furthermore, while these measures are being explored, they are still not the main drivers in making decisions about a program’s effectiveness.

Access: https://pdf.usaid.gov/pdf_docs/PA00TBMB.pdf

Feasibility and Acceptability Study of Preparing Corn Soy Blend with Fortified Vegetable Oil in Malawi

Authors: Beatrice Rogers, Gray Maganga, Shelley Walton, Lauren Jayson, Simone Passarelli, Devika Suri, Breanne Langlois, Kenneth Chui, Jocelyn Boiteau, Elizabeth Ignowski, Irwin Rosenberg, Stephen Vosti, Patrick Webb

Date Published: June 2015

Executive Summary: Efforts to prevent and treat MAM typically rely on nutrient-dense supplementary foods, which commonly include several variations of fortified blended foods (FBFs), combinations of FBFs with other commodities, and ready-to-use supplementary foods (RUSFs). Corn Soy Blend (CSB) with fortified vegetable oil is one such combination used in Title II USAID programs to treat MAM. The Food Aid Quality Review (FAQR) is a project of Tufts University with collaboration and funding from USAID, Food for Peace (FFP), assessing the nutritional quality of food aid products used in the prevention and treatment of moderate acute malnutrition (MAM) in children. Phase I of the FAQR recommended that CSB porridge for treatment of MAM be prepared and consumed with FVO (fortified with Vitamin A and D) in the ratio of 30 g FVO to 100 g CSB (abbreviated 30:100). Phase I also recommended providing CSB in repackaged, individual, packets with printed behavior-change messaging giving instructions on proper preparation of the porridge. These recommendation were made with the aim of increasing the caloric density of CSB porridge, improving the absorption of fat-soluble vitamins through the additional FVO:CSB ratio, and improving the preparation and use CSB porridge through SBCC. The smaller CSB packets also have the potential to streamline the distribution process and create more hygienic CSB storage. However, the programmatic feasibility of this recommendation and the extent to which caregivers’ cooking practices could be altered was unknown.

Access: https://pdf.usaid.gov/pdf_docs/PA00M9BB.pdf

Citation: Rogers, Beatrice; Maganga, Gray; Walton, Shelley; Jayson, Lauren; Passarelli, Simone; Suri, Devika; Langlois, Breanne; Chui, Kwan Ho Kenneth; Boiteau, Jocelyn; Ignowski, Elizabeth; Rosenberg, Irwin; Vosti, Stephen; Webb, Patrick. 2015. Feasibility and Acceptability Study of Corn Soy Blend and Fortified Vegetable Oil in Malawi, Report to USAID from the Food Aid Quality Review. Boston, MA: Tufts University.
EXECUTIVE SUMMARY: This report examines the best practices and lessons learned from the rollout of 25 new and upgraded food aid products in United States Agency for International Development (USAID) Office of Food for Peace (FFP) programs during the period 2011-2015, with the goal of achieving greater impact, being more evidence-based and better “fit for purpose.” Systems have been quickly evolving and this document is intended to help preserve institutional memory of product introduction. These past processes should be captured in order to inform future product introduction and rollout and to make approaches more efficient and effective for food aid stakeholders and recipients.

The report discusses six steps in the rollout process: 1) product specifications development; 2) production scale up; 3) establishment of product testing and quality assurance systems; 4) procurement of product and shipping (through solicitation); 5) shipping and delivery of product; and 6) storage, handling and distribution of product. Each step was reviewed in terms of key stakeholder involvement and roles; successes and challenges were identified.

Three types of product rollouts are detailed in the report: 1) product upgrades, 2) product adaptations, and 3) new product introductions. Two case studies are included on: 1) the introduction of fortified rice and 2) the harmonization of product specifications for Ready-To-Use Foods (RUF) among UN agencies and U.S. Government requirements.


EXECUTIVE SUMMARY: In July 2016, the United States Agency for International Development’s (USAID’s) Food Aid Quality Review Phase III (FAQRIII) project collaborated with Sierra Leone’s Ministry of Health and Sanitation (MoHS), Ministry of Education, Science and Technology (MEST), with support from the World Food Programme (WFP) and Project Peanut Butter to conduct formative research on proper cooking instructions and taste acceptability for three fortified blended flour (FBF) products. This research was carried out in preparation for a cluster-randomized, intent-to-treat, cost-effectiveness study of four fortified food products in the treatment of moderate acute malnutrition (MAM) in the Pujehun District of Sierra Leone set to begin in March 2017 (“Four Foods Study”). The results will be used to finalize the standard packaging for the FBFs and to adapt training materials or messaging at point of distribution.

Over a one-week period, 96 female caregivers participated in standardized sensory and taste tests, controlled cooking observations, and focus group discussions to provide insight on normal cooking practices. Overall, the FBFs were well received by the female caregivers, with reported high levels of acceptability of taste and smell (i.e., “liked a lot” on the five-point Likert Scale). Factors identified as influencing proper preparation of the Corn-Soy Blend (CSB) porridges included: literacy and exposure to a demonstration of proper procedures. From participants’ feedback, the team recommended slight changes to the pictures that will appear on the FBF packaging, including: darkening the color of the oil, changing the image for water to better represent water droplets, and altering the images to be more literal (e.g., showing two cups of water pouring into a pot when two cups of water are needed). These changes will be incorporated into the instructions which will appear on the FBF packages distributed during the Four Foods Study.

Access: https://pdf.usaid.gov/pdf_docs/PA00MM2P.pdf

Citation: Quee, Daniel; Tucker, Harrison; Koroma, Mariatu; Griswold, Stacy; Walton, Shelley; Suri, Devika; Langlois, Breanne; Rogers, Beatrice. 2016. Cooking Instruction Development and Acceptability Tests of Corn-Soy Blend Porridges: Pujehun District, Sierra Leone. A report from the Food Aid Quality Review, managed by Tufts University’s Friedman School of Nutrition Science and Policy. Boston, MA.
EXECUTIVE SUMMARY: The USAID Food Aid Quality Review (FAQR) project2 is developing tools to maximize cost-effectiveness in the food aid value chain while also promoting efficiency gains across the US government and global food aid actors. Driven by the priorities, mission, and mandate of the United States Agency for International Development (USAID)/Office of Food for Peace (FFP) to increase efficiency, maximizing USAID/FFP's ability to provide assistance and making the most of the tax dollars. In order to promote conversation around the FAQR developed tools and other important, relevant tools, the FAQR team organized a session at the 2017 Health and Humanitarian Logistics (HHL) Conference in Copenhagen, Denmark on June 7th, 2017.

Four food aid supply chain cost effectiveness tools currently being developed and used by development and humanitarian organization decision makers at different levels were presented as case studies during the conference session. This report summarizes the cases and offers insight into the future strategies for maximizing food aid supply chain cost effectiveness.

ACCESS: https://foodaidquality.org/sites/default/files/publications/Food%20Aid%20Quality%20Review_HHL%20Workshop%20Report_Final_12.27.17%5B1%5D.pdf
Executive Summary: As part of United States Agency for International Development’s (USAID’s) ongoing improvement process and to highlight the latest advancements in its food aid programs and products, USAID’s Office of Food for Peace (FFP) is reviewing and revitalizing its online presence. In support of this process, Food Aid Quality Review (FAQR) Phase III conducted a landscape analysis of current USAID FFP web-based resources available on its Commodities Resource Portal (“Portal”), to assess structure and content of materials available online and determine preliminary redesign recommendations for discussion with Portal users. The Portal encompasses the section of the USAID FFP website related to food aid products programmed in FFP programs. Per USAID, the Portal aims to 1) educate the general public about USAID FFP food assistance programs, 2) provide background and context on USAID’s ongoing efforts to improve the nutrition and overall quality of the food aid commodity basket, and 3) provide guidance for Private Voluntary Organizations (PVOs) and other stakeholders to inform their FFP proposal development process. This report provides our analysis and assessment of the current Portal design, information and resources and includes preliminary recommendations for an updated portal that would provide succinct, usable information within the current USAID website design and structure. This report is the first step in a broader effort to update and revamp the Portal to better reflect the U.S. food aid basket, food aid context and to improve online food aid product information, especially as new products are introduced. The report includes an 1) Overview of the Food for Peace Commodities Resource Portal, 2) Analysis by Portal Section, review and analysis of 3) World Food Programme Product Information and 4) Suppliers & Commercial Industry Product Information and 5) Preliminary Recommendations.


Citation: Schlossman, Nina; Koeppel, Leah; Fisk, Rebecca and Johnson, Quentin. 2017. Food for Peace Commodities Resource Portal: A Landscape Analysis. A Report from the Food Aid Quality Review, managed by Tufts University’s Friedman School of Nutrition Science and Policy. Boston, MA.
# FAQR Resource Book Posters

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adherence to Ration Guidance During Preparation or Feeding of Four Specialized Nutritious Foods Does Not Influence Recovery from Moderate Acute Malnutrition (MAM)</td>
<td>42</td>
</tr>
<tr>
<td>Comparative Effectiveness of Four Specialized Nutritious Food Products for Treatment of Moderate Acute Malnutrition in Sierra Leone</td>
<td>43</td>
</tr>
<tr>
<td>Cost and Cost-Effectiveness of Four Specialized Nutritious Foods for Treatment of Moderate Acute Malnutrition in Sierra Leone</td>
<td>44</td>
</tr>
<tr>
<td>Changes in Body Composition Using Deuterium Dilution Technique among Young Children Receiving Specialized Nutritious Foods for Treatment of Moderate Acute Malnutrition in Sierra Leone</td>
<td>45</td>
</tr>
<tr>
<td>Environmental Enteric Dysfunction as a Potential Modifier of the Effect of Specialized Nutritious Foods in the Treatment of Moderate Acute Malnutrition in Sierra Leone</td>
<td>46</td>
</tr>
<tr>
<td>A Tale of Two Measures: Self-Report and Lab-Assessed Values in Amount of Oil Added to CSB Porridge Prepared by Caregivers of Children with Moderate Acute Malnutrition in Southern Malawi</td>
<td>47</td>
</tr>
<tr>
<td>The role of dairy in the comparative effectiveness and cost of fortified blended foods versus ready-to-use foods in treatment of children with moderate acute malnutrition</td>
<td>48</td>
</tr>
<tr>
<td>Costing Methods for a Cluster-Randomized Cost-Effectiveness Trial Comparing the Performance of Four Supplementary Foods in Treating Sierra Leonean Children with Moderate Acute Malnutrition</td>
<td>49</td>
</tr>
<tr>
<td>Design and Baseline Characteristics of a Study Comparing Four Supplementary Foods in the Prevention of Stunting and Wasting Among Children 6-23 Months in Burkina Faso</td>
<td>50</td>
</tr>
<tr>
<td>Experiences of Beneficiary Caregivers in a Supplementary Feeding Program in Southern Malawi</td>
<td>51</td>
</tr>
<tr>
<td>Effective delivery of social-behavioral change communication through a care group model in a supplementary feeding program: a descriptive analysis</td>
<td>52</td>
</tr>
</tbody>
</table>
Accelerated Shelf-Life Studies and Micronutrient Stability of Food Aid Products: Implications for the Humanitarian Supply Chain

Research Methods Used to Determine Cost-Effectiveness of a Supplementary Feeding Trial to Prevent Child Undernutrition in Burkina Faso

Methods for rigorous in-home observation conducted during a food aid cost-effectiveness trial in Burkina Faso

Changes in household food insecurity between enrollment and exit from a blanket supplementary feeding program for children 6-23 months old in Burkina Faso

Accelerated Shelf-Life Studies: Testing Micronutrient Stability of New and Upgraded Food Aid Products

Who are we really feeding with specialized food aid products?

A Mobile Data Collection Tool Using Android Tablets for In-Home Observations in Sierra Leone Improves Data Quality

Behaviors Surrounding Ration Use in a Blanket Supplementary Feeding Program in Burkina Faso

Community Cluster Approach: Its Added Value in Surveys Conducted at Rural Community Level

Evaluating Opportunity Cost of Caregivers’ Time and its Impact on Comparative Cost-Effectiveness of Supplementary Foods to Prevent Child Undernutrition in Burkina Faso

U.S. Food Safety Modernization Act Standards Now Being Applied to Food Aid Products for Nutrition and Humanitarian Response

Lessons Learned from Cost-Effectiveness Research for Specialized Nutritious Food Assistance in West Africa

Integrating Cost-Effectiveness into Nutrition Programming Decisions of Specialized Nutritious Foods: An Evidence-Informed Interactive Tool

Temporal Patterns in Linear and Ponderal Growth Velocity among Children 6-23 Months in Burkina Faso
Adherence to Ration Guidance During Preparation or Feeding of Four Specialized Nutritious Foods Does Not Influence Recovery from Moderate Acute Malnutrition (MAM)

AUTHORS: Stacy Griswold, Breanne Langlois, Devika Suri, Ye Shen, Shelley Walton, Kenneth Chui, and Beatrice Rogers

DATE/PLACE OF PRESENTATION: June 2019, American Society for Nutrition (ASN)

ABSTRACT:
Objectives:
Fortified blended flours (FBFs) require preparation with boiling water, sometimes with fortified vegetable oil (FVO), using prescribed quantities and ratios. Lipid-based nutrient supplements (LNS) are ready-to-eat, individually packaged, and prescribed for consumption without adding other ingredients/foods. This study assessed compliance with recipe and ration instructions and whether this influenced treatment effectiveness for moderate acute malnutrition (MAM).

Methods:
A cluster-randomized clinical-effectiveness trial in Sierra Leone compared four isocaloric foods in treating children 6–59 mos with uncomplicated MAM: Corn-Soy Blend Plus with FVO (CSB +), Corn-Soy Whey Blend with FVO (CSWB), Super Cereal Plus with amylase (SC + A), or ready-to-use-supplementary food (RUSF). Caregivers were advised bi-weekly by trained nurses on ingredients, quantities, and daily rations. A random sub-sample participated in in-depth interviews on ingredients used at the last preparation. Respondents were categorized in two ways: (for FBFs) using too little, the correct amount or too much or (for RUSF) correct if eaten without other food; or using the recommended ratios of ingredients. Unadjusted logistic regression evaluated the relationship between compliance and graduation from treatment.

Results:
Graduation rates among 958 respondents: 70% CSB +, 67% CSWB, 66% SC +, and 66% RUSF. Reported use of correct ingredients was: 99% of CSB +, 97% of CSWB, and 99% of SC + A and 86% RUSF reported eating without mixing. Reported use of correct amount of flour: 34% in CSB +, 27% in CSWB, and 43% in SC + A of those, 95% in CSB + and 96% in CSWB also used the correct amount of oil. Among all caregivers, 86% in CSB + and 92% in CSWB used the correct amount of oil. In unadjusted models, the relationships between compliance behaviors and graduation were not statistically significant.

Conclusions:
Reported use of correct ingredients was high for all study foods; among FBFs, amount of flour was often different from the recommendation while amount of oil was often correct. Further research may explain apparent low importance of emphasizing ration guidance when designing information, education, and communication for MAM treatment programs.

ACCESS: Adherence to Ration Guidance During Preparation or Feeding of Four Specialized Nutritious Foods Does Not Influence Recovery from Moderate Acute Malnutrition (MAM)
Comparative Effectiveness of Four Specialized Nutritious Food Products for Treatment of Moderate Acute Malnutrition in Sierra Leone

AUTHORS: Breanne Langlois, Stacy Griswold, Ilana Cliffer, Devika Suri, Ye Shen, Kenneth Chui, Shelley Walton, Lindsey Green, Aminata Koroma, Mark Manary, Irwin Rosenberg, Patrick Webb, and Beatrice Rogers

DATE/PLACE OF PRESENTATION: June 2019, American Society for Nutrition (ASN)

ABSTRACT:
Objectives:
This study compared the effectiveness of 4 specialized nutritious foods (SNFs) used for the treatment of moderate acute malnutrition (MAM) in children <5 years of age in Pujehun District, Sierra Leone.

Methods:
This was a cluster-randomized trial operating through a supplementary feeding program (SFP) providing SNFs for treatment of MAM. Three study foods were fortified blended foods – Super Cereal Plus w/amylase (SC + A), Corn-soy Blend Plus w/oil (CSB + w/oil), and Corn-soy-whey Blend w/oil (CSWB w/oil) – and one was a lipid-based Ready to Use Supplementary Food (RUSF). From 4/2017 to 11/2018, children with MAM, defined as mid-upper arm circumference (MUAC) ≥11.5 cm and <12.5 cm without bipedal edema, were enrolled at participating health clinics and received rations bi-weekly until they reached an outcome or for up to 12 weeks. A stratified randomization technique was used to select 28 sites and randomize them into 7 per arm based on pre-determined criteria. During the study, an 8th site was added to the CSWB w/oil arm due to low enrollment. The primary outcome was graduation from SFP defined as MUAC ≥12.5 cm within the 12-week treatment period. Mixed-effect regression assessed whether there were differences in graduation rates among children treated with one of the 4 SNFs.

Results:
A total of 2683 children were enrolled out of a planned sample size of ~5000. Overall: 63% graduated from MAM, 19% developed severe acute malnutrition (SAM), 7% defaulted (missed 3 visits in a row), 1% died, and 10% reached no outcome within 12 weeks. Twenty-five % were transferred into the study from SAM treatment. By study arm, graduation rates were: 62% in CSWB w/oil, 65% in SC + A, 64% in CSB + w/oil, 62% in RUSF. In an unadjusted model, statistically significant differences in graduation rates among children treated with one of the 4 SNFs.

Conclusions:
The 4 foods performed comparably in treating MAM in unadjusted analysis. Decision-making by donors, governments, and programmers on which food to program should also be based on cost-effectiveness analysis.

AUTHORS: Ye Shen, Stacy Griswold, Breanne Langlois, Devika Suri, Stephen Vosti, Patrick Webb, and Beatrice Rogers

DATE/PLACE OF PRESENTATION: June 2019, American Society for Nutrition (ASN)

ABSTRACT:
Objectives:
To estimate cost-effectiveness of 4 specialized nutritious foods (SNF) for Moderate Acute Malnutrition (MAM) treatment in children under five in Pujehun District, Sierra Leone

Methods:
In a cluster randomized trial, a mobile supplementary feeding program was set up at 29 peripheral health units to treat children with MAM (mid-upper arm circumference (MUAC) ≥11.5 cm and <12.5 cm without bipedal edema) with 1 of 4 iso-caloric rations: Corn Soy Blend Plus w/oil (CSB + w/oil, reference), Corn Soy Whey Blend w/oil (CSWB w/oil), Super Cereal Plus w/amylase (SC + A), or Ready to Use Supplementary Food (RUSF). All foods were procured from U.S. except locally produced RUSF. Unlike RUSF and oil provided in commonly programmed specifications, CSB +, CSWB, and SC + A were produced in experimental package size or formulation at small scale. Caregivers picked up rations bi-weekly until children reached an outcome or up to 12 weeks. Collected from accounting records and study instruments using activity-based costing with ingredients, data on 10 components from implementer perspective (start-up, supply chain, and programming) were summarized into cost per enrolled child in 2018 USD for each arm. Other stakeholders’ costing perspectives will also be analyzed. To assess cost-effectiveness by arm, cost per recovered child = cost per enrolled child/graduation rate. Predicted means of crude graduation rate (% of children reaching MUAC ≥12.5 cm in 12 weeks) with 95% confidence intervals were estimated from unadjusted mixed-effect model to construct crude cost-effectiveness ranges. Future analyses will be based on adjusted modeling and realistically estimated product costs at scaled production.

Results:
Children (N = 2681) received similar number of bi-weekly rations by arm. Product and international freight were top drivers of cost differences across arms. Crude graduation rate was not statistically different by arm. Cost per enrolled child ranged from $86 in RUSF to $94 in SC + A. Cost per recovered child was $137 ($130 - 145) in RUSF, $142 ($134 - 151) in CSB + w/oil, $146 ($138 - 155) in SC + A, and $149 ($140 - 160) in CSWB w/oil.

Conclusions:
Crude cost-effectiveness to treat MAM considering only implementer cost was similar across 4 SNFs.

ACCESS: Cost and Cost-Effectiveness of Four Specialized Nutritious Foods for Treatment of Moderate Acute Malnutrition in Sierra Leone
Changes in Body Composition Using Deuterium Dilution Technique among Young Children Receiving Specialized Nutritious Foods for Treatment of Moderate Acute Malnutrition in Sierra Leone

AUTHORS: Isabel Potani, Devika Suri, Akriti Singh, Stacy Griswold, William Wong, Breanne Langlois, Ye Shen, Kwan Ho Kenneth Chui, Irwin Rosenberg, Patrick Webb, Beatrice Rogers

DATE/PLACE OF PRESENTATION: June 2019, American Society for Nutrition (ASN)

ABSTRACT:
Objectives:
To determine differential changes in children's body composition—fat-free mass (FFM) and fat mass (FM)—after 4 weeks of treatment for moderate acute malnutrition (MAM) with one of 4 four specialized nutritious foods (SNFs).

Methods:
This sub-study was nested within a larger cluster-randomized trial comparing the cost-effectiveness of 4 isocaloric SNFs in treating MAM among children 6–59 months in Pujehun District, Sierra Leone: Corn-Soy Blend Plus w/oil (CSB + w/oil), Super Cereal Plus w/amylase (SC + A), Corn-Soy-Whey Blend w/oil (CSWB w/oil) and Ready-to-use Supplementary Food (RUSF).

Study Setting and Methods:
This sub-study was nested within a larger cluster-randomized trial comparing the cost-effectiveness of 4 isocaloric SNFs in treating MAM among children 6–59 months in Pujehun District, Sierra Leone: Corn-Soy Blend Plus w/oil (CSB + w/oil), Super Cereal Plus w/amylase (SC + A), Corn-Soy-Whey Blend w/oil (CSWB w/oil) and Ready-to-use Supplementary Food (RUSF). Children with mid-upper arm circumference (MUAC) ≥11.5 cm and <12.5 cm with no clinical complications were enrolled and received an SNF ration bi-weekly until they reached MUAC ≥12.5 cm or up to 12 weeks. Body composition was assessed using the deuterium dilution technique at program enrollment and after 4 weeks of treatment. Changes in weight, FM, FFM and %FFM overall and by study arm were calculated; statistical significance was determined using t-tests and ANOVA (unadjusted).

Results:
Among 336 subjects at enrollment, mean ± SD age was 11.8 ± 6.5 mos, weight was 6.5 ± 0.9 kg, FM was 1.3 ± 0.5 kg, FFM was 5.2 ± 0.9 kg, and %FFM was 80.4 ± 7.3. After 4 weeks of treatment, mean ± SD change in weight was 0.44 ± 0.39 kg (P < 0.001), FM was 0.09 ± 0.60 kg (P = 0.005), FFM was 0.35 ± 0.56 (P < 0.001), and %FFM was 0.003 ± 8.5 (NS). Overall, weight gain consisted on average of 20.9% FM and 79.8% FFM. By study arm, mean ± SD changes in FM and FFM respectively, were: 0.12 ± 0.53 kg and 0.32 ± 0.49 kg in CSB + w/oil; 0.13 ± 0.67 kg and 0.34 ± 0.64 kg in SC + A; 0.08 ± 0.65 kg and 0.36 ± 0.57 kg in CSWB w/oil; 0.02 ± 0.49 kg and 0.39 ± 0.5 kg in RUSF. These changes were not significantly different across study arms.

Conclusions:
Over 4 weeks of treatment for MAM, children gained roughly 80% lean mass relative to 20% fat mass. This body composition is consistent with predicted sustainability of recovery from MAM and healthier long-term disease risk. Differential effects on body composition by type of SNF were not detected after 4 weeks of treatment in this study.

Environmental Enteric Dysfunction as a Potential Modifier of the Effect of Specialized Nutritious Foods in the Treatment of Moderate Acute Malnutrition in Sierra Leone

**AUTHORS:** Akriti Singh, Isabel Potani, Stacy Griswold, Devika Suri, Breanne Langlois, Ye Shen, Shelley M. Walton, Kenneth Kwan Ho Chui, Patrick Webb, Irwin H. Rosenberg, and Beatrice L. Rogers

**DATE/PLACE OF PRESENTATION:** June 2019, American Society for Nutrition (ASN)

**ABSTRACT:**

**Objective:**
- To understand how specialized nutritious foods (SNFs) enable a child to recover from moderate acute malnutrition (MAM), the role of conditions such as environmental enteric dysfunction (EED), impairment of the small intestine, needs to be studied.

- The objective of this study was to examine whether EED at enrollment modifies the effect of SNFs on graduation from a MAM treatment program.

**Conclusions:**
- Prevalence of EED at enrollment was high (77%) among MAM children in this study.
- EED (L:M test) at enrollment did not affect graduation from the MAM treatment program within 12 weeks.
- EED (L:M test) at enrollment did not modify the effect of any of the SNFs in regard to graduation from the MAM treatment program within 12 weeks.
- These findings suggest that EED may not affect graduation from the program, or that EED changes over the course of treatment.

**ACCESS:**
A Tale of Two Measures: Self-Report and Lab-Assessed Values in Amount of Oil Added to CSB Porridge Prepared by Caregivers of Children with Moderate Acute Malnutrition in Southern Malawi

**Authors:** Breanne Langlois, Beatrice Rogers

**Date/Place of Presentation:** April 2016, Experimental Biology

**Abstract:**

**Objective:** To compare self-reported with laboratory-assessed grams oil per 100 grams Corn-Soy Blend (CSB) in porridge prepared by caregivers of beneficiary children receiving the food as treatment for moderate acute malnutrition.

**Methods:**

This was a secondary analysis of an effectiveness study conducted in Southern Malawi in 2014 assessing 2 interventions designed to increase the amount of oil added to CSB porridge prepared by caregivers, with a target of 30 g added oil per 100 g CSB. The Control Group received standard monthly ration: 1 L oil, 8 kg CSB in bulk. Intervention groups received 2.6 L oil, 8 kg CSB provided either in bulk (Group 1) or in 4 2-kg packages with printed messages (Group 2), and social behavior change communication to meet added oil target (Groups 1 and 2). Data were collected through structured interviews with caregivers and lab analysis of porridge samples. Paired sample t-tests compared oil added to CSB porridge (oil g per 100 g CSB) from self-report and lab analysis within each study group (Wilcoxon when appropriate); ANOVA test assessed the mean difference (self-report – lab value) between the study groups. Bland-Altman plots were used to display the discrepancy between the 2 measures.

**Results:**

A total of 584 caregivers participated: n=192 in Group 1; n=196 in Group 2; n=196 in the Control Group. The mean ± SDs of added oil (in g per 100 g CSB) from self-report and lab analysis, respectively, were: 30±9 and 28±16 (Group 1), 30±9 and 25±15 (Group 2), 15±9 and 12±10 (Control). Estimated added oil from self-report was significantly higher than lab analysis within each study group (p<0.05 for all). Among the study groups, the mean differences between the measures of added oil (reported – lab) were not significant (p=0.56). A cluster of observations in the intervention groups had abnormally high fat content in lab assessed values; sensitivity analysis excluding this cluster showed mean lab values of added oil were reduced to 22±12 in both intervention groups, causing differences in self-report versus lab to become significantly larger in the intervention groups compared to control (p=0.002). Bland-Altman plots revealed a clear bias between the 2 measures in the intervention groups: participants tended to over-report the amount of oil used, but as the lab-assessed amount increased (i.e. as their behavior changed towards using more oil) there was a shift towards under-reporting. This was less evident in the control group. Both self-report and lab-assessed values showed the same relationships among the study groups, with Groups 1 and 2 having more added oil than the Control.

**Conclusion:** Caregivers in the intervention groups reported what they were instructed to do, regardless of whether lab analysis reflected the targeted behavior change. While self-report was not as reliable as the lab measure, both conveyed that intervention group caregivers added more oil to porridge than the control group. Laboratory analysis was critical to determine the precise magnitude of added oil to CSB porridge.

The role of dairy in the comparative effectiveness and cost of fortified blended foods versus ready-to-use foods in treatment of children with moderate acute malnutrition

AUTHORS: Devika Suri, Denish Moorthy, Irwin Rosenberg

DATE/PLACE OF PRESENTATION: April 2016, Experimental Biology

ABSTRACT:
Objective:
Recent meta-analyses found treating young children with MAM using ready-to-use foods (RUF) versus fortified blended foods (FBF) resulted in higher recovery rates and weight gain. This analysis aimed to compare studies of RUF and FBF with and without dairy to determine whether the addition of dairy to these food supplements modified the comparative effectiveness and cost of treatment.

Methods:
A review of literature on the comparative effectiveness of FBF and RUF in treatment of MAM was conducted. Outcomes of recovery from MAM, weight gain and length gain were compared among study cohorts, which included FBF with dairy (FBF+), FBF without dairy (FBF−), RUF with dairy (RUF+) and RUF without dairy (RUF−). Data on recovery from MAM was pooled among the 4 supplement categories. The cost per 500 kcal of each category of food supplement was averaged among studies that reported cost data.

Results:
Among the 7 studies included, 9 RUFs were tested, of which 5 contained dairy, and 9 FBFs were tested, of which 3 contained dairy. Children treated with RUF+ had higher recovery rates compared with FBF− in 5 out of 5 study cohorts, higher weight gain in 4 out of 4, and significantly higher length gain in 1 out of 4. Children treated with RUF+ vs FBF+ had higher recovery rates in 1 out of 2 study cohorts, with no differences in weight or length gain. No differences were found in the 2 studies comparing RUF− and FBF+. Finally, children treated with RUF− had higher recovery rates compared with FBF− in 1 of 2 studies, higher weight gain in 2 out of 2, and no differences in length gain. Recovery from MAM among the 7 studies was 65% (FBF−), 79% (FBF+), 82% (RUF−), and 80% (RUF+). Four of the 7 studies included cost data; on average per 500 kcal costs were $0.15 (FBF−), $0.18 (FBF+), $0.17 (RUF−), and $0.35 (RUF+).

Conclusion:
Our results suggest that addition of dairy to FBF make it comparative in effectiveness to both RUF with and without dairy, but does not appear to be a factor between the RUF categories. RUF with dairy was twice the cost per kcal compared with the other food supplement categories. Cost-effectiveness analysis will be useful to help determine the most appropriate food supplement for treatment of MAM.

Costing Methods for a Cluster-Randomized Cost-Effectiveness Trial Comparing the Performance of Four Supplementary Foods in Treating Sierra Leonean Children with Moderate Acute Malnutrition

Authors: Ye Shen, Stacy Griswold, Devika Suri, Stephen Vosti, Beatrice Rogers

Date/Place of Presentation: April 2017, Experimental Biology

Abstract: Policy makers need cost-effectiveness measures to support better decision-making in nutrition policy and programming. Therefore, proper planning and implementation of cost data collection and cost-effectiveness analysis analysis is needed.

As part of the Food Aid Quality Review (FAQR) Project at Tufts Friedman School of Nutrition Science and Policy, a comprehensive cost-effectiveness research protocol was designed for a cluster-randomized field trial in Pujehun District, Sierra Leone. The study objective is to evaluate and compare the cost-effectiveness of four isocaloric supplementary foods in treating MAM.

The objective of this communication is to strengthen and to make more consistent cost-effectiveness research methods undertaken alongside field-based nutrition trials.

USAID Title II programs are meant to reduce food insecurity around the world through distribution of food aid products that provide for the immediate dietary needs of vulnerable populations. The Food Aid Quality Review (FAQR), a project implemented by Tufts University and its many partners, recommended improvements in the formulations and programming of existing Title II supplementary foods. To test these recommendations and add to rare literature comparing the effectiveness of different products in malnutrition prevention in a natural setting we are examining the effectiveness and cost-effectiveness of four different supplementary foods in the prevention of stunting and wasting in children age 6 to 23 months in Burkina Faso.

Experiences of Beneficiary Caregivers in a Supplementary Feeding Program in Southern Malawi

Authors: Breanne Langlois, Devika Suri, Ye Shen, Shelley Walton, Gloria Alvarez, Katie Moses, Beatrice Rogers

Date/Place of Presentation: April 2017, Experimental Biology

Abstract: Tufts University is conducting a review of the quality of food aid products used in nutrition programs. One part of this project was a study examining the feasibility of increasing the ratio of fortified oil to Corn Soy Blend (CSB) in porridge prepared by caregivers of children enrolled in a supplementary feeding program for treatment of moderate acute malnutrition in Southern Malawi. Increased oil is intended to increase calorie density and Essential Fatty Acids content. Focus group discussions were conducted among participating caregivers in order to better understand their perceptions and experiences in the supplementary feeding program (SFP). The objective of this analysis was to identify and describe these findings.

Effective delivery of social-behavioral change communication through a care group model in a supplementary feeding program: a descriptive analysis

Authors: Lauren Wilner, Devika Suri, Breanne Langlois, Shelley Walton, Beatrice Rogers

Date/Place of Presentation: April 2017, Experimental Biology

Abstract: Phase I of the Food Aid Quality Review recommended that Corn-Soy Blend (CSB) porridge for treatment of moderate acute malnutrition (MAM) be prepared and consumed with fortified vegetable oil in the ratio of 30 g oil to 100 g CSB (target ratio=30:100). A 2014 study examined the feasibility of increasing the ratio of oil to CSB in porridge prepared by caregivers of children with moderate acute malnutrition, in order to increase caloric density and improve the absorption of fat-soluble vitamins (Rogers et al). This study found that this can be achieved with an increased oil ration, along with SBCC (Social Behavior Change Communication).

Along with slight changes in the supplementary food ration, a key component of this intervention was SBCC. Social behavior change communication (SBCC) is often used in nutritional interventions, but few studies have documented the transfer of communication from healthcare workers to caregivers. This analysis describes the flow of key SBCC messages delivered through a care-group model during an intervention aimed at increasing the oil in corn-soy blend (CSB) porridge prepared by caregivers of children under 5 enrolled in a MAM treatment program in Malawi.

Accelerated Shelf-Life Studies and Micronutrient Stability of Food Aid Products: Implications for the Humanitarian Supply Chain

Authors: Nina Schlossman, Quentin Johnson, Lauren Wood, Nicole Coglianese, Vicky Santoso, Leah Koeppel

Date/Place of Presentation: June 2017, Health and Humanitarian Logistics Conference and IFT 2017 Annual Meeting and Food Expo

Abstract: Food aid products can be exposed to conditions throughout the humanitarian supply chain (e.g., sustained exposure to high levels of heat and humidity) that can potentially affect or degrade products, including nutritional properties, taste, odor and packaging integrity and appearance. For these reasons, understanding how products behave through the supply chain is critical to ensure that optimum nutrition and quality are delivered to food aid consumers. Shelf life studies are vital part of product research and development and introduction of new/upgraded food aid products, to determine how product nutrients and characteristics are maintained throughout the supply chain. They can also be used to determine the shelf life implications of new or modified packaging or combinations of ingredient and packaging parameters. Studying product packaging performance in real-time would require a 2-3 year period of observation under storage conditions. Accelerated shelf life studies are designed to mimic real-time conditions found in the humanitarian supply chain in a fraction of the time for a cost-effective, efficient alternative to real-time studies.

Research Methods Used to Determine Cost-Effectiveness of a Supplementary Feeding Trial to Prevent Child Undernutrition in Burkina Faso

Authors: Ye Shen, Ilana Cliffer, Devika Suri, Stephen Vosti, Patrick Webb, Beatrice Rogers

Date/Place of Presentation: October 2017, International Congress of Nutrition (ICN)

Themes: Cost-effectiveness, supplementary feeding, stunting, wasting, food aid

Abstract: Policymakers increasingly call for evidence of cost-effectiveness in international aid and nutrition programming. Guidance on tailoring methods to policy relevant questions is limited, making it challenging to determine cost-effectiveness in programmatic settings. As part of the Food Aid Quality Review (FAQR) funded by USAID/Food For Peace Office (FFP), we describe cost-effectiveness research methods applied to a supplementary feeding trial comparing four specialized nutritious food aid products for prevention.

Methods for rigorous in-home observation conducted during a food aid cost-effectiveness trial in Burkina Faso

**AUTHORS:** Ilana Cliffer, Laetitia Nikièma, Franck Garanet, Devika Suri, Breanne Langlois, Ye Shen, Shelley Walton, Patrick Webb, Beatrice Rogers

**DATE/PLACE OF PRESENTATION:** October 2017, International Congress of Nutrition (ICN)

**THEMES:** Methods, observation, supplementary feeding, cost-effectiveness

**ABSTRACT:**

**Background and Objectives:**
- In-home observation methods help satisfy the need for direct assessments of feeding behaviors.
- We describe a multi-day approach to in-home observation aimed at understanding food preparation and feeding practices during a study comparing the cost-effectiveness of food aid in Burkina Faso.

**Conclusion:**
Multi-day in-home observations can provide rigorous data on observed food preparation and feeding practices and reduce the Hawthorne effect. Techniques, including using tablets, which may streamline data collection, should be further refined to address noted challenges.

**ACCESS:** [https://foodaidquality.org/sites/default/files/publications/MethodsforRigorous.pdf](https://foodaidquality.org/sites/default/files/publications/MethodsforRigorous.pdf)
Changes in household food insecurity between enrollment and exit from a blanket supplementary feeding program for children 6-23 months old in Burkina Faso

AUTHORS: Breanne Langlois, Laetitia Nikiëma, Ilana Cliffer, Devika Suri, Ye Shen, Patrick Webb, Beatrice Rogers

DATE/PLACE OF PRESENTATION: October 2017, International Congress of Nutrition (ICN)

THEMES: Supplementary feeding, malnutrition, household food insecurity, Burkina Faso

ABSTRACT:

Background and Objectives:
• To assess household food insecurity between program enrollment and exit in a longitudinal trial assessing the effectiveness of four supplementary foods in the prevention of stunting and wasting in young children participating in a blanket supplementary feeding program between Aug/2014 – Jun/2015.

Methods:
• Data were collected at baseline and exit from the program.
• Descriptive analysis of household food insecurity was conducted among participating households.
• Change in Household Food Insecurity Access Scale (HFIAS) score (endline – baseline), stratified by baseline HFIAS category and season of program enrollment and exit were calculated.

Results:
• 6,052 children enrolled: 5,236 completed the program; 5,206 analyzed

<table>
<thead>
<tr>
<th>Aggregate (partially analyzed)</th>
<th>beige</th>
<th>endline</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFIAS score, median (IQR)</td>
<td>3.81 (1.03, 5.75)</td>
<td>4.32 (1.03, 7.26)</td>
</tr>
<tr>
<td>HFIAS category (n, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food secure</td>
<td>2249 (43)</td>
<td>1815 (35)</td>
</tr>
<tr>
<td>Mildly food insecure</td>
<td>705 (14)</td>
<td>806 (16)</td>
</tr>
<tr>
<td>Moderately food insecure</td>
<td>1472 (28)</td>
<td>1537 (30)</td>
</tr>
<tr>
<td>Severely food insecure</td>
<td>769 (15)</td>
<td>919 (18)</td>
</tr>
</tbody>
</table>

• Disaggregated by season, mean changes varied: dry/dry 0.16±5.75, n=1066; rainy/rainy 1.38±5.42, n=176; rainy/dry -0.07±0.77, n=880; dry/rainy 1.10±5.82, n=3280
• Households that were food secure or mildly food insecure at baseline had an increase in food insecurity at endline, on average, while households that were moderately or severely food insecure at baseline had a decrease in food insecurity at endline, on average.

Conclusions:
• Overall, food insecurity increased among households enrolled in a supplementary feeding program for young children, but varied according to baseline status and season of program enrollment and exit.
• More work needed to understand the dynamics of household food insecurity in the context of a supplementary feeding program.

ACCESS: https://foodaidquality.org/sites/default/files/publications/ICN%20poster%20HFIAS%20BKL.pdf
Accelerated Shelf-Life Studies: Testing Micronutrient Stability of New and Upgraded Food Aid Products

AUTHORS: Nina Schlossman, Quentin Johnson, Lauren Wood, Nicole Coglianese, Vicky Santoso, Leah Koeppel

DATE/PLACE OF PRESENTATION: October 2017, International Congress of Nutrition (ICN)

THEMES: Food aid, product, stability, micronutrient, shelf life

ABSTRACT: Food aid products can be exposed to conditions throughout the humanitarian supply chain (e.g., sustained exposure to high levels of heat and humidity) that can potentially affect or degrade products, including nutritional properties, taste, odor and packaging integrity and appearance. For these reasons, understanding how products behave through the supply chain is critical to ensure that optimum nutrition and quality are delivered to food aid consumers. Shelf life trials are a vital part of product research and development and introduction of new/upgraded food aid products, to determine how product nutrients and characteristics are maintained throughout the supply chain. They can also be used to determine the shelf life implications of new or modified packaging or combinations of ingredient and packaging parameters. Studying product and packaging performance in real time would require a 2-3 year period of observation under storage conditions. Accelerated shelf life studies are designed to mimic real time conditions found in the humanitarian supply chain in a fraction of the time for a cost-effective, efficient alternative to real time studies.

Objective: determine the vitamin and mineral stability and integrity of U.S. products included in the Food Aid Quality Review (FAQR) Phase II food aid effectiveness trials. Tests were carried out on three Fortified Blended Foods (FBFs) [Corn Soy Whey Blend (CSWB), Super Cereal Plus (SC Plus), Corn Soy Blend Plus (CSBP)] and on Ready-to-Use Supplementary Food (RUSF).

Who are we really feeding with specialized food aid products?

AUTHORS: Ilana Cliffer, Breanne Langlois, Devika Suri, Laetitia Nikiema, Beatrice Rogers

DATE/PLACE OF PRESENTATION:
November 2017, ACF Research for Nutrition Conference

ABSTRACT:
Significance: Sharing practices appear to be widespread among beneficiaries in a blanket supplementary feeding program in Burkina Faso, despite efforts to target rations to specific beneficiaries for prevention of undernutrition. It is likely that such practices are pervasive in similar programs elsewhere. This highlights the importance of considering diversion in all policies and programming surrounding in-kind food aid.

Background: From June 2014-December 2016, data on sharing practices were collected during a study comparing the cost-effectiveness of four specialized food aid products used for prevention of stunting and wasting in children 6-23 months in Sanmatenga, Burkina Faso.

Objective: Understand sharing practices among beneficiaries of a blanket supplementary feeding program receiving food for prevention of malnutrition.

A Mobile Data Collection Tool Using Android Tablets for In-Home Observations in Sierra Leone Improves Data Quality

AUTHORS: Breanne Langlois, Stacy Griswold, Memuna Kadie Sawi, Devika Suri, Ye Shen, Beatrice Rogers

DATE/PLACE OF PRESENTATION: June 2018, American Society for Nutrition (ASN)

ABSTRACT:
Background: In an ongoing trial assessing the effectiveness and cost-effectiveness of 4 specialized foods used for treatment of moderate-acutenutrition (MAM), In-Home Observations (IHOs) are being conducted to help understand behaviors surrounding use of supplementary food rations in the household. Paper-based methods used in prior studies were prone to data quality issues. We describe a tablet-based IHO data collection tool developed by the Food Aid Quality Review Project.

Behaviors Surrounding Ration Use in a Blanket Supplementary Feeding Program in Burkina Faso

**AUTHORS:** Breanne Langlois, Ilana Cliffer, Devika Suri, Ye Shen, Laetitia Nikiema, Patrick Webb, Beatrice Rogers

**DATE/PLACE OF PRESENTATION:** June 2018, American Society for Nutrition (ASN)

**ABSTRACT:** From 2014 to 2016, a trial was conducted through an existing blanket supplementary feeding program in Burkina Faso to assess the effectiveness and cost-effectiveness of four food aid products used for prevention of stunting and wasting in young children:

- Corn Soy Blend Plus & Oil
- Corn Soy Whey Blend & Oil
- Super Cereal Plus
- Ready-to-use Supplementary Food

We aimed to understand the factors that influence comparative effectiveness of the four supplementary food aid products by exploring behaviors surrounding the use of the foods.

**BACKGROUND & OBJECTIVE:**

From 2014 to 2016, a trial was conducted through an existing blanket supplementary feeding program in Burkina Faso to assess the effectiveness and cost-effectiveness of four food aid products used for prevention of stunting and wasting in young children.

**STUDY SETTINGS & METHODS:**

- Surrattango Province, Burkina Faso
- Existing Title II USG supplementary feeding program targeting children 6-23 months
- Geographically defined, 14-month-long study with random assignment
- Enrollment of 6,312 children at age 6 months, followed for 18 months
- Participants were randomly assigned to one of four food aid treatments
- Sharing & distribution, preparation, and consumption (all aspects) were explored

**FINDINGS:**

- There was no reported or observed stunting
- 8.13% reported giving the ration away
- 48% reported that the ration does not last the entire month as intended, with the highest in CSWB
- 18-20 years of age were observed using the ratios for other household members (CSWB and CSB, respectively)
- Household per capita income and education levels were lower than expected. In unadjusted analysis, CSWB had the lowest reported consumption of the recommended dose (%)

**CONCLUSIONS:**

Food aid products were delivered to households for consumption by beneficiaries. There was evidence that most of the food was not consumed as directed. CSWB was stored more and eaten less frequently than expected. These findings are important in understanding the effectiveness of these products and have implications for program-specific outcomes. To achieve intended impacts, supplementary feeding programs should support improved adherence to these behaviors to recommended use of nutritionally balanced food aid products.

**Access:** [https://foodaidquality.org/sites/default/files/publications/ASNposterBurkinaRationUseBehaviors.pdf](https://foodaidquality.org/sites/default/files/publications/ASNposterBurkinaRationUseBehaviors.pdf)
Community Cluster Approach: Its Added Value in Surveys Conducted at Rural Community Level

AUTHORS: Memuna Kadie Sawi, David Yambasu, Stacy Griswold, Beatrice Rogers, Devika Suri, Breanne Langlois

DATE/PLACE OF PRESENTATION: June 2018, American Society for Nutrition (ASN)

ABSTRACT:
Introduction:
A longitudinal study is being implemented in Sierra Leone comparing the effectiveness and cost-effectiveness of four different supplementary foods in a supplementary feeding program (SFP) for treatment of Moderate Acute Malnutrition in children age 6 to 59 months. The study is implemented by Tufts University in partnership with the Sierra Leone Ministry of Health and Sanitation, Washington University in St. Louis, Project Peanut Butter, and Caritas Bo.

Objective:
Describe the advantages of using a community cluster approach in organizing a community-based survey.

ACCESS:
https://foodaidquality.org/sites/default/files/publications/CommunityClusterASN.pdf
Evaluating Opportunity Cost of Caregivers’ Time and its Impact on Comparative Cost-Effectiveness of Supplementary Foods to Prevent Child Undernutrition in Burkina Faso

Authors: Ye Shen, Ilana Cliffer, Stephen Vosti, Devika Suri, Breanne Langlois, Beatrice Rogers

Date/Place of Presentation: June 2018, American Society for Nutrition (ASN)

Abstract:
Background & Objective: Opportunity cost of caregivers’ time is generally overlooked in the nutrition intervention programs. As part of the Food Aid Quality Review (FAQR) Project at Tufts Friedman School of Nutrition Science and Policy, we evaluated the opportunity cost of caregivers’ time and its impact on relative cost-effectiveness of four specialized nutritious foods in preventing stunting and wasting in a blanket supplementary feeding program (SFP) for children in Burkina Faso.

Study Design:
- 48 food distribution points in Sawanklang Luang,中部 of Burkina Faso.
- Existing 450,000 USD USAID supplementary feeding program (SFP) targeting pregnant and lactating mothers and children 6-23 months old.
- Four geographic regions randomly assigned to one of four 6-site-by-site study areas.
- Evaluated 6,963 children and 6-months olds.
- Monthly food distribution and anthropometric measurements in food distribution points for 18 months with additional data collection in households, communities and other relevant sources.

Caregivers’ Perspective in the Supplementary Feeding Program:
- Opportunity cost per monthly ration at USD 6.25.
- Opportunity cost per monthly ration at USD 6.25.
- Opportunity cost per monthly ration at USD 6.25.
- Opportunity cost per monthly ration at USD 6.25.

Conclusions:
- Time spent in study food preparations is the largest contributor to the difference in caregivers’ opportunity cost among the four study arms, with RUSF the arm with the highest opportunity cost.
- Younger caregivers’ opportunity cost is higher compared to caregivers’ opportunity cost.
- The higher the number of children being fed, the higher the opportunity cost.

U.S. Food Safety Modernization Act Standards Now Being Applied to Food Aid Products for Nutrition and Humanitarian Response

**Authors:** Nina Schlossman, Quentin Johnson, Beth Weeks

**Date/Place of Presentation:** June 2018, American Society for Nutrition (ASN)

**Abstract:**

**Background:** Over the last 8 years, the Food Safety Modernization Act (FSMA) transformed the Food and Drug Administration (FDA) food safety and quality assurance regulations for farmers, manufacturers and importers by shifting focus from responding to cases of foodborne illness to the prevention of foodborne illness in both the domestic and international food supply chain.

**Objective:** Introduce modern food safety and microbiology standards into specifications for food aid products to address and prevent moderate acute malnutrition (MAM) as part of the United States Agency for International Development (USAID) efforts to improve nutrition and safety of food aid products distributed worldwide.

**Methods:**
Research standards and apply them to the manufacturing specifications for each product. Starting with the micronutrient fortified blended flour (MFB) products, the deoxynivalenol (DON) test for vomitoxin has been developed and added to the specifications for all grain-based food aid products.

**Results:**
Specifications for Corn-Soy Blend Plus, Super Cereal Plus (SCP), and Fortified Milled Rice now include FSMA-appropriate microbiological testing. Improved formulations deliver bioavailable forms of iron and enhanced micronutrients, and SCP includes a dose of animal protein from dairy. These foods are widely consumed as part of a humanitarian ration and targeted to mothers and children in the first 1,000 days to address MAM. These vulnerable populations will benefit most immediately from improved food aid safety measures.

**Conclusions:**
International guidelines for the food aid products distributed by organizations such as WFP, USAID, USDA, and MSF are important for ensuring simplified requirements for verifying quality and safety at the source. The application of FSMA to the food aid supply chain, with DON testing can be applied globally will be essential to ensure safety as more and more local and regional manufacturers supply the humanitarian food aid basket.

**Access:** [https://foodaidquality.org/sites/default/files/publications/FSMA%20poster_ASN18_GFN.pdf](https://foodaidquality.org/sites/default/files/publications/FSMA%20poster_ASN18_GFN.pdf)
Lessons Learned from Cost-Effectiveness Research for Specialized Nutritious Food Assistance in West Africa

AUTHORS: Devika Suri, Stephen Vosti, Breanne Langlois, Ilana Cliffer, Stacy Griswold, Patrick Webb, Beatrice Rogers

DATE/PLACE OF PRESENTATION: October 2018, Global Evidence and Implementation Summit (GEIS)

ABSTRACT:

Background & Objective:
- Burden of stunting and wasting remains high globally, but resources are limited for nutrition interventions targeting infant and young children at risk. Robust cost-effectiveness evidence is important for programming decisions, but literature is sparse on cost-effectiveness of specialized nutritious foods (SNFs) in supplementary feeding programs.
- As part of the Food Aid Quality Review (FAQR) Project, we conducted two field studies to evaluate the comparative cost-effectiveness of four specialized nutritious foods:
  - To prevent stunting and wasting in a blanket supplementary feeding program for children 6-23 mo in Burkina Faso (BK).
  - To treat moderate acute malnutrition (MAM) in a targeted supplementary feeding program for children 6-59 mo in Sierra Leone (SL).

ACCESS:
https://foodaidquality.org/sites/default/files/publications/GEIS2018%20Poster_CE%20Field%20Research_FINAL.pdf
Integrating Cost-Effectiveness into Nutrition Programming Decisions of Specialized Nutritious Foods: An Evidence-Informed Interactive Tool

**Objective**

Table of contents

1. Set up one scenario

   - Treatment of Moderate Acute Malnutrition (MAM)
   - Treatment of Severe Acute Malnutrition (SAM)
   - Prevention and Early Recovery (PER) of Acute Malnutrition

   - Prevention of Severe Acute Malnutrition (P-SAM)

2. Review cost-effectiveness and use effectiveness mapping
   - FACET inputted supplier (e.g., food cost, labor cost, and nutrition cost)
   - Use of cost-effectiveness analysis
   - Use of cost-effectiveness ratio

3. Construct multiple scenarios
   - Change certain aspects to create additional scenarios in FACET, use all scenarios that you would like to compare.

4. Compare across scenarios
   - Download cost-effectiveness analysis data for comparison
   - Use cost-effectiveness analysis data to support decision-making

**Methods**

FACET was developed in Shiny, a web application framework for R. Using FACET as the interface, the tool allows the user to input different scenarios and evaluate the cost-effectiveness of nutritional programs.

**Results**

During FACET development, multiple rounds of user engagement were conducted. The tool was tested with various stakeholders to ensure its usability and effectiveness.

**Conclusion/Discussion**

FACET brings together diverse expertise and available data and strengthens nutrition program funders and implementing partners’ decision-making capacity around cost-effectiveness. The development of FACET serves as an example of how the research community can facilitate bringing data/evidence into real-world decision-making.

**Authors**: Ye Shen, Stephen A. Vosti, Beatrice L. Rogers, Patrick Webb

**Date/Place of Presentation**: June 2020, American Society for Nutrition (ASN)

**Abstract**: Objectives: An interactive Food Assistance Cost-Effectiveness Tool (FACET) was created to support funders and implementing partners of selected nutrition programs involving specialized nutritious foods (SNF) to factor cost-effectiveness into programming decisions in development and humanitarian contexts.

**Results**: User engagement has helped identify applications of the FACET tool:

- New SNF product vetting, e.g., assessing the extent to which promising new products can ‘compete’ with existing products in terms of cost-effectiveness.

**Conclusions**: FACET brings together diverse expertise and available data and strengthens nutrition program funders and implementing partners’ decision-making capacity around cost-effectiveness. The development of FACET serves as an example of how the research community can facilitate bringing data/evidence into real-world decision-making.

Temporal Patterns in Linear and Ponderal Growth Velocity among Children 6-23 Months in Burkina Faso

**OBJECTIVES:**
- Investigate links between velocities of linear (length) and ponderal (weight) growth over time
- Use results to determine optimal timing of undernutrition interventions

**METHODS:**
- Monthly length and weight data collected from 6,112 children aged 6-23 months participating in a feeding program in Burkina Faso, from July 2014 to September 2016.
- Mixed effects models with multiple lag periods built to determine links between length gain (cm/month) and weight gain (kg/month) and vice versa.
- Lag periods included growth velocity measurements taken one (t-1) to four (t-4) months prior to the outcome velocity.
- Controls for age, rainy season (June-September), intervention arm (which are geographic regions), morbidities.

**RESULTS:**
- Faster linear growth is followed by lower future weight gain.
- Doubling the average ponderal growth velocity (0.18 kg/month) is associated with 3%–0.2% higher linear growth velocity one to four months later, while doubling the average linear growth velocity (0.95 cm/month) is associated with 16%–3% lower ponderal growth velocity one to four months later. In all cases, the magnitude of a growth velocity's association with future growth velocities decreases as the time interval increases.

**CONCLUSIONS:**
- Episodes of faster linear growth are associated with lower subsequent ponderal growth, demonstrating temporal dependencies.
- For infants in Burkina Faso, linear growth spurts may not be accompanied by sufficient increases in dietary intake to avoid a slowdown in weight gain.
- To improve child growth, programs should combine strategies that address both height and weight.

**Access:**
https://www.eventscribe.com/shared/posters/fullscreen.asp?pvfp=Nzk2Mnw0MDQzOTUxN3wxMzQwOTI2fFdlYnNpdGU