FEASIBILITY AND ACCEPTABILITY STUDY OF PREPARING CORN SOY BLEND WITH FORTIFIED VEGETABLE OIL IN MALAWI

A SUMMARY OF A REPORT FROM THE FOOD AID QUALITY REVIEW

Efforts to prevent and treat moderate acute malnutrition (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, Office of 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 Social and Behavioral Change Communication (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 these recommendations and the extent to which caregivers' cooking practices could be altered was unknown.

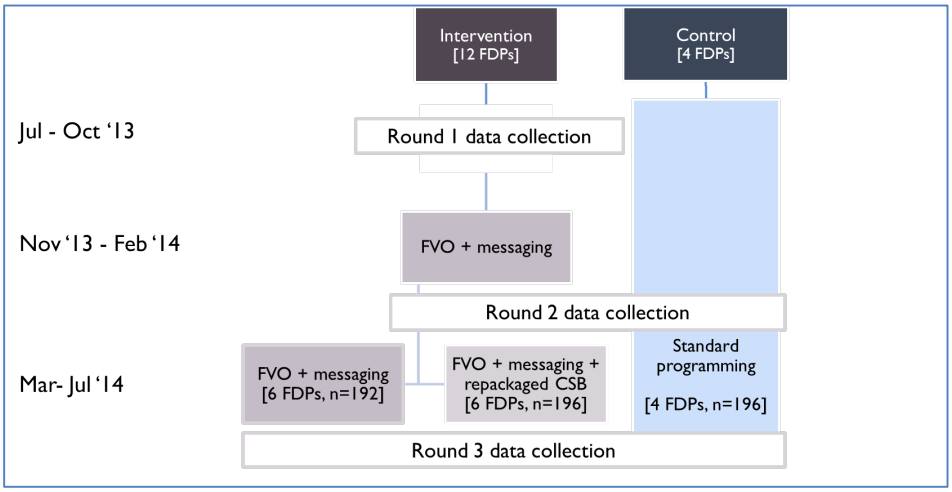
From July 2013 to July 2014, Tufts University conducted a repeat cross-sectional study in Southern Malawi. This study assessed whether, and the extent to which, an increased ration of FVO, delivered with Social and Behavior Change Communication (SBCC), could influence compliance with the recommended target ratio (30:100) in CSB porridge prepared by beneficiary mothers/caregivers (BMCs). The target group in this study were BMCs and the study was conducted under a MAM treatment program in Southern Malawi. Children (children 6-59 months of age) identified as having MAM (using mid-upper-arm circumference measurements and thresholds) in their home villages were enrolled in the Supplementary Feeding Program (SFP), through which they received four monthly food rations that could be retrieved at predetermined Food Distribution Points (FDPs) on announced delivery days. BMCs with children enrolled in the SFP in 16 purposively selected FDPs across four

districts: Mulanje, Chiradzulu, Machinga and Balaka served as the sampling frame for the study. BMCs were randomly selected from rosters for participation from within the FDPs.

This study had three main objectives: **(1) assess feasibility of the interventions to increase the FVO:CSB ratio in porridge prepared by BMCs, and assess the effectiveness of interventions to achieve that goal; (2) determine the cost and cost-effectiveness of the interventions; and (3) assess potential determinants of effectiveness and cost-effectiveness of the interventions.**

There were three rounds of data collection: (1) Baseline; (2) Intervention 1 and Control; and (3) Intervention1, Intervention 2 and Control. The control group received the standard, monthly Malawian SFP ration (one L of FVO and eight kg of CSB distributed in bulk from 25-kg sacks). Intervention Group 1 received a monthly ration of 2.6 L of FVO and eight kg of CSB in bulk, along with intensified SBCC emphasizing the importance of preparing CSB porridge at the recommended FVO:CSB ratio. Intervention Group 2 received the same intervention as Intervention Group 1 (2.6 L FVO/month, eight kg CSB/month with intensified SBCC), and received the CSB repackaged into two kg packets with printed behavior-change messaging giving instructions on proper preparation of the porridge. Formative research was conducted prior to implementation of the interventions, in order to develop the SBCC messages used in the interventions.

STUDY FLOW AND TIMELINE OF DATA COLLECTION



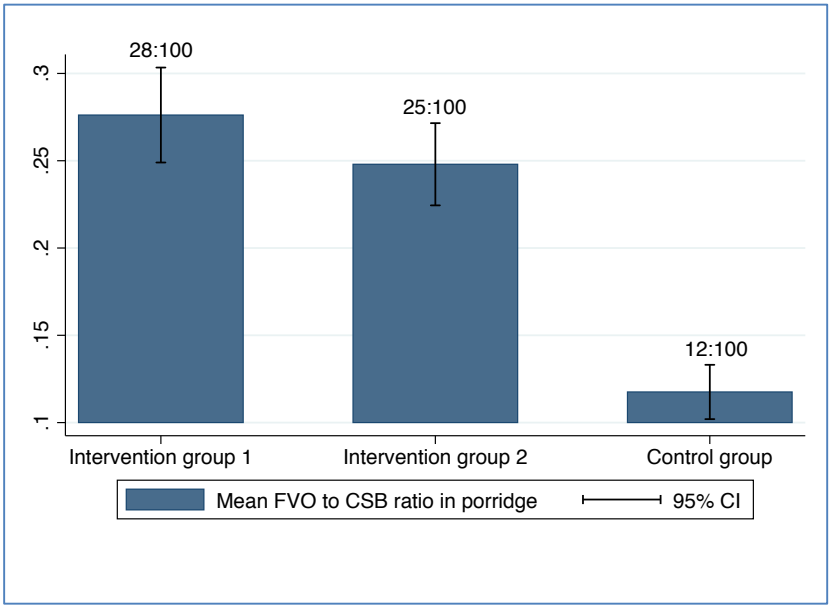
The primary outcome of this study was mean FVO:CSB ratio (i.e. grams of FVO per 100 g of CSB) in prepared porridge. Additionally, to assess compliance with the target ratio, a second primary outcome was percentage of BMCs reaching or exceeding a FVO:CSB ratio of 30:100, as determined by lab analysis of porridge samples taken from beneficiary households.

RESULTS

A total of 584 BMCs participated in this analysis: n=192 in Intervention Group 1; n=196 in Intervention Group 2; n=196 in the Control Group. Objective 1 results showed that the mean FVO:CSB ratio was significantly higher in the two intervention groups than in the control: 28:100 in Intervention Group 1; 25:100 in Intervention Group 2; 12:100 in the Control Group ($p<0.001$). Additionally, the proportion of BMCs meeting or exceeding the target FVO:CSB ratio of 30:100 was significantly higher in the two intervention groups compared to the control group ($p<0.001$): 37 percent in Intervention Group 1, 30

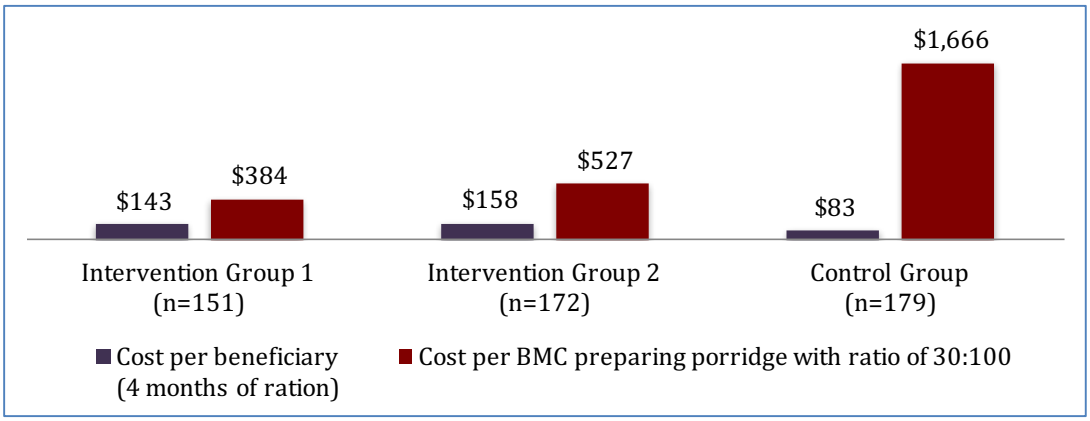
percent in Intervention Group 2 and 5 percent in the Control Group. There was no statistically-significant difference in FVO:CSB ratios across the two intervention groups. Reported sharing (defined as anyone other than the beneficiary child consuming CSB porridge) was higher in the Control Group than the Intervention Groups. Observed sharing behavior was similar to that of reported.

Results: Mean FVO to CSB Ratios across Study Groups



Individual components included in the cost assessment (Objective II) were: commodity purchases; international shipping and national and local transportation; warehousing; labor costs; BMC travel time to/from FDPs; intervention-related costs (e.g. repackaging materials and labor) and pre-implementation investments (e.g. SBCC formative research and design of CSB repackaging). The average estimated cost per beneficiary, i.e. cost per four one-month rations distributed as programmed, was $143 US dollars in Intervention Group 1, $158 US dollars in Intervention Group 2 and $83 US dollars in the Control Group. Using the percentages of BMCs meeting or exceeding the target FVO:CSB ratio of 30:100 from Objective 1, the marginal cost of one additional BMC meeting or exceeding the target ratio in Intervention Group 1 was $188 US dollars, and in Intervention Group 2, was $300 US dollars. Overall, these findings indicate that Intervention Group 1 was the more cost-effective of the two interventions seeking to increase the FVO:CSB ratio in prepared porridge.

Results: Cost-Effectiveness



CONCLUSION

This study concludes that BMCs provided with an additional FVO ration and SBCC will, on average, prepare porridge with a higher FVO:CSB ratio, and that significantly more BMCs will prepare porridge that is at or above the 30:100 ratio recommended, compared with BMCs receiving standard programming. The study found no added impact on measured FVO:CSB porridge ratios when delivering the CSB in two kg packages that contained messaging and cooking instructions. As expected, the average cost per beneficiary was lowest for the control group, but on average FVO:CSB ratios were low and only a small proportion of BMCs in this group were preparing porridge at or above the recommended 30:100 ratio. Increasing the amount of FVO delivered to BMCs and providing information regarding porridge preparation increased costs, but also increased both the average FVO:CSB ratios and the proportion of BMCs preparing porridge at or above the recommended FVO:CSB ratio. When extra FVO and messaging were provided, repackaging CSB into smaller, message-containing packages did not alter the FVO:CSB ratio or the proportion of BMCs reaching or exceeding the recommended FVO:CSB ratio. While repackaging of CSB in Intervention 2 was less cost-effective in terms of increasing porridge FVO:CSB ratio, there may be other benefits such as improved hygiene and BMC preference for packaging. The study design did not permit measuring the separate effects of providing the additional 1.6 L of FVO or the SBCC messaging.

Changes in programming can induce BMCs to increase the average FVO:CSB ratio in the porridges they prepare, in some cases up to or beyond recommended levels. The expected benefits of doing so in terms of improvements in child nutrition and health remain to be measured, and these benefits should be set alongside the marginal programming costs reported here in order to determine the wisdom of supplying additional FVO and SBCC. Our results suggest that repackaging CSB should be deleted from the list of program options aimed at influencing FVO:CSB porridge preparation ratios, although repackaging may generate other benefits that were not measured in this study.

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The link to the full report is forthcoming.

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