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Background

Malnutrition is one of the most important causes of child mortality in Ethiopia being the underlying cause of 57% of child deaths in Ethiopia. These children and their mothers suffer from the poor health and nutrition situation in the country. Stunting and underweight rates of children aged from 6 to 59 months in Ethiopia is one of the highest in the world making both short term and long term nutrition intervention measures very crucial. As part of the effort to tackle this deep rooted problem, WFP developed chickpea based locally produced RUSF products and collaboratively worked with EPHI to assess the sensory acceptability of 2 locally-produced chickpea-based RUSF formulae among moderately malnourished children aged 6 to 59 months and assess the readiness of their caregivers to administer such food.

Objective

The general objective of the study was to assess sensory acceptability of locally-produced chickpea-based RUSF “Acha Mum” among moderately malnourished children (6-59 months) and to assess the readiness of their caregivers to administer such food. The “Acha Mum” formula has further been remodelled into 4 formulae that were made available for the acceptability trial and these included: (i) chickpeas only; (ii) Chickpeas + maize; Chickpea_Maize_Soy; and (iv) Chickpeas + Soya. GUTs Agro Industry, an Ethiopian food processor, produced the first batch of 200kg each of RUSF formulae for this purpose.

The specific objectives of the study included (i) To assess the level of acceptance of two chickpea-based RUSF products by children 6 to 59months in terms of liking or disliking of the product; (ii) To examine the level of acceptance of two chickpea-based RUSF products by children 6 to 59months in terms of quantity consumed per feed and any effect it may have on their health; and (iii) To assess acceptability of two chickpea-based RUSF products by caregivers of children 6 to 59months in terms of taste, flavor, color and texture.

Methodology

A quantitative descriptive analysis using a 5 point hedonic scale among a total of 140 mother-baby pairs provided 1,298 tests (524 preference 774 Acceptability) was conducted in 5 hotspot priority 1 woredas representing 5 regions of Oromia, SNNPR, Amhara, Tigray and Somali. The study was integrated within the OTP care programme. The 4 chickpea based RUSF formulae were assessed for microbial, macro- and micro-nutrients and subsequently certified by the Food, Medicine and Health Care Administration and Control Authority (FMHACA).

The target group obtained by (i) mobilization from community (69percent); and (ii) recently discharged from OTP and enrolled into the TSF (31percent). At the 10 sites (2 per woreda), 28children and 28mothers per woreda were selected through systematic random sampling method and the selection criteria included: (i) Any child aged 6 to 59months without SAM and not suffering from any illness; and (ii) Mothers/caregivers of children aged 6 to 59 months, regardless of nutritional status. The indices collected included socio-demographic information; Anthropometric measurements; Sensory Evaluation – Preference and Acceptability. The parameters used for Sensory Evaluation included (i) Child's RUSF Intake and test (Mother's response and Interviewer's response; (ii) Mother/caretaker's RUSF Test – Taste, Smell, Texture, Appearance, overall acceptability; (iii) Amount of RUSF

Result and Discussion

The socio-demographic information showed that about half of the respondents (46percent) were farmers while 29percent were housewives; only 21percent had formal education. Of those who were farmers, 72percent owned farmland. Both sexes were equally represented in the sample size among children with 46percent being males while 54percent, females. According to

the age category, 41percent of children were in the 6 to 23months category while 59percent in the 24 – 59months. About half (46percent) of households had 4 or more children with median maternal age during child birth reported at 28.61+5.85 years.

On Child Diet Diversity, about 89percent of children consumed complementary food from starchy staple food; 17% Vitamin A rich foods; 57% DGLVs; no child consumed meat, fish and eggs; 49.3% legumes, nuts and seeds; 36.4percent, milk and milk products and the Mean Dietary Diversity was rated at 2 out of the 9 food groups. The Infant and Young Child Feeding practices were rated poor with 44percent of mothers initiated breast-feeding for their children within 1 hour after birth; Overall rate of exclusive breastfeeding was 57%; Timely introduction of complementary foods was 47%; and Mean meal frequency of study participants was 3.69.

The preference test was conducted so as to select 2 out of the 4 products to be taken through the sensory acceptability evaluation. The one way ANOVA analysis was conducted so as to compare means of the four products based on 9 different parameters. The results indicated that there was no statistically significant difference among the 5 out of the 9 parameters of (i) Child response as perceived by the mother; (ii) Child response as perceived by the interviewer; (iii) Amount of RUSF consumed by the child during the test period; (iv) Time spent with the food by the child during the study period; and (v) Smell of the RUSF product as tested by the mother. However, on the 4 other parameters, chickpea only was statistically significant compared to the other 3 products (Chickpea+Maize+Soya; Chickpea+Maize; Chickpea+Soya). To be able to select one of the 3 products to be taken to the acceptability test phase, the one way ANOVA analysis was conducted but there was no statistical significance among the 3 products and therefore to be able to select one of the 3, there were other considerations made that involved cost of production, nutritional quality and processing method. These were however noted to be the same for all the 3 products making it difficult to select one. Given the challenge faced in selecting one of the 3 products, a lottery method was used where Chickpea+Soya was selected to represent the other 2 products in the follow on phase of the acceptability trial.

Acceptability evaluation was conducted with the aim of selecting one of the 2 products that would be taken to the next level of effectiveness trial. Using the same method as the preference test, the Chickpea only product was statistically significantly ($p < 0.05$) higher than Chickpea+Soya in relation to the Child response as perceived by mothers/caregivers and interviewers; and Amount of time spent with RUSF. Following the acceptability evaluation by product type (Using mothers response), two (2) products were well accepted with average mean values greater than 4 (slightly liked) but the chickpea only product was observed to be statistically significantly ($P < 0.05$) better accepted in all five parameters – test, smell, texture/mouth feel, appearance and overall acceptability. In relation to acceptability evaluation by age, the amount of RUSF consumed by children from 48-59 months was higher than children who were from 6 to 11 months and similarly, children aged 48-59months rated product slightly higher than those aged 6-11 months (child response as perceived by mother and interviewer).

Acceptability evaluation by region based on the mothers'/ caregivers' and interviewers' response found that Amhara region had accepted the two products more than the other 4 regions with an average mean value of 4.76 and 4.59 by mother/caregiver and interviewer respectively. Furthermore, based on the mother/caregiver's tests, there was higher acceptance of the 2 products mainly from Amhara and Tigray regions in terms of smell and texture. Mothers' perception of appearance of the products and their overall acceptability was similar in most regions except SNNPR where the rating of the 2 products was rated low with an average mean value of 4.59

In relation to sex, male children had higher acceptance of the 2 products than their female counterparts with average mean value of 4.58 compared to 4.45 and also male children consumed the two products more with average amount of 42.58 grams as compared to 35.36gms to their female counterparts. The acceptability of the product by Child's RUSF Intake- Mother's response over six days increased numerically but not significantly and also child's RUSF Intake based on interviewer's response over the six day period increased slightly from 4.19 to 4.42.

Conclusion

Given that the rating for the 2 products was above 4 implied that the products were in the score of between 'slightly like' and extremely like', the study indicates that these products were both well accepted by the study subjects with chickpea only product being much more accepted of the two.

Recommendations

Based on the findings of the study, the following are the recommendations:

1. Given that the 2 formulae developed and produced by WFP Ethiopia are within the range “slightly liked or extremely liked”, the study therefore recommends that they are undertaken through an effectiveness study on children to evaluate their impact on child nutritional status and micronutrient status in order to ensure the wider utilization in addressing malnutrition in the country. In addition, since one of the two products – Chickpea+Soya – is a representation of the other two products that were part of the study (Chickpea+Soya+Maize and Chickpea+Maize), the study also recommends for the products to go through the effectiveness trial based on justifiable reasoning that need to be given by WFP on food matrix and nutritional profile.
2. There is need to improve the consistency of the products taking into account the climatic and storage conditions of the different regions. Improvement in packaging of the products is also recommended;
3. The proposed names for the chickpea based RUSF should be subjected to a wider audience in the qualitative assessment to identify the most suitable name to be used in the whole country if found effective in the follow on study;
4. The study has identified that the packaging material was not suitable for such a purpose owing to the fact that such a product needs to be contained in a well sealed packaging material. The packaging also need be redesigned in manner that will be easier and more suitable to feed children right from the packaging.
5. The information obtained from this study would be critical in improving programming on treatment and prevention of malnutrition. As much as possible, the report should be used in the development of the social marketing and BCC strategies for the prevention and treatment of Moderate Acute Malnutrition after the effectiveness of the products are confirmed with the follow on study; and
6. Chickpeas were widely grown and consumed in most of the study areas of Tigray, Amhara and SNNPR and therefore this opportunity should be explored to promote wider production and consumption of the chickpeas at both household and commercial levels. The Purchase for Progress (P4P) programme could utilize this opportunity to support Co-operative Unions to make chickpeas available on the market given its importance;

Acknowledgment



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