



**Micronutrient powder (MNP) Acceptability  
Trial  
In  
Kharaz Refugee Camp and surrounding host villages**

**Draft Report**

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**MOH, ENN and CSSW**

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## LIST OF ABBREVIATIONS

CHW	Community Health Workers
CSSW	Charitable Society for Social Welfare
ENA	Emergency Nutrition Assessment
FGD	Focus Group Discussion
GAM	Global Acute Malnutrition
GFD	General Food Distribution
HH	Household
KI	Key Informant
MNP	Micronutrient Powder
MOH	Ministry of Health
NCHS	National Centre for Health Statistics
SFP	Supplementary Feeding Programme
SHS	Society for Humanitarian Solidarity
UNHCR	United Nations High Commissioner for Refugees
WFH	Weight for length/height Z score
WFP	World Food Programme
WHO	World Health Organisation

## EXECUTIVE SUMMARY

**Introduction:** Anaemia, as demonstrated by the latest nutrition survey (July 2010), remains a major public health problem affecting 58.9% (95% CI: 53.2-64.4) and 64.5% of the children in Kharaz refugee camp and the surrounding host community respectively. In addition, stunting prevalence in children aged 6-59 months (HAZ <-2) was found to be 22.0 % (95% CI: 17.4 - 27.3) and 34.2 % in Kharaz and surrounding host community respectively. In an attempt to address the problems of anaemia and other micronutrients deficiencies and increase the micronutrient intake of children aged 6-59 months, UNHCR is proposing to use micronutrient powders (MNP) as a blanket intervention for all children 6-59 months in the camp and in the surrounding host community. In order to ensure that the target population accepts the product, understands its purpose and uses the product as intended, UNHCR conducted an acceptability trial in August –September 2010 in both the refugee camp as well as the surrounding host community.

**Objective:** The overall objective was to assess the acceptability of MNP among children 6-59 months old in the refugee camp and in the local host community.

**Setting:** The trial was implemented in in Kharaz refugee camp as well as in the surrounding host community, Yemen

**Materials and methods:** The study was a community based acceptability trial with a sub sample of the population in the refugee camp and one village in the surrounding local population given the intervention and followed up for four weeks in order to get an understanding the community perception and acceptability of the MNP product.

A total of 120 and 45 children were required in the MNP trial. Purposive sampling to capture important groups was done with seven blocks out of the 71 blocks in the camp and only Huweirab village was selected out of the seven villages in the surrounding villages. An understanding of the camp arrangement was done before the sampling so as to understand how refugees are settled so as to capture how important ethnic groups of interest in the trial.

The MNP was distributed in single-dose sachets and each caregiver was asked to provide one sachet a day to their child, mixed with a meal in an individual plate (at any mealtime during the day). A total of 30 sachets per child was given to the caregiver after fulfilling the eligibility criteria. Detailed instructions were given concerning the method of mixing with food, sharing of the food and possible expected side effects. The trial period took a period of four weeks starting from 10<sup>th</sup> of August to 8<sup>th</sup> of September 2010

The trial employed a number of research instruments using both qualitative and quantitative methods to understand the acceptability of the MNP. Factors associated with the use and acceptability of the product were explored. Positive aspects, barriers, cultural food eating habits, and underlying reasons for the acceptability results were also investigated. Compliance to the intervention<sup>1</sup> was categorized at four levels (very low, low, adequate, very high) and was assessed using data collected during the mid-point and end point visits. Data from questionnaires was entered in EPI data and analysed using SPSS Version 16.0. Data from FGDs, KIs and direct observations were processed using Microsoft Word and organized by topics to look across responses from all respondents in order to identify consistencies, differences and relationships, and were analyzed manually

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<sup>1</sup> Compliance to the intervention is defined as *the number of sachets consumed over the total number recommended over a defined period of time*

**Results and Interpretation:** A total number of 135 and 45 children were enrolled in the study in the camp and the surrounding host community respectively. There were six and four drop-outs at the end point in the camp and in the surrounding host community respectively.

A total of 90.6% of both the refugee camp and the surrounding host community mentioned that they liked the MNP. Similarly a high proportion of respondents (97.7% in camp and 100% in surrounding host community) reported at the end point that the product was easy to use .

There were no major concerns reported by the caregivers regarding the occurrence of side effects. The majority (97.8%) did not attribute the side effects to the MNP except for the observed stool colour changes. Most of the women in the camp who had been in the supplementation programme during their pregnancy understood that the darkening of the stool was to be expected.

At the end of the trial, the results showed high compliance.. High adherence to the MNP intervention was seen among 91.4% and 87.5% of the families in the refugee camp and in the surrounding areas respectively.

The level of activity of the children on the MNP was reported as very good in 80.6 % and good in 17.1% of the children in the camp as the end of the trial. Similarly there rating in the host community were 63.4% and 36.6% for very good and good respectively.

Good appetite was mentioned as a positive effect for the children taking MNP. About 82.9% and 92.7% of the caregivers in the refugee camp and in the surrounding host community reported very good appetite at the end of the trial interview. FGD and KI results also indicated the improved appetite and activity of the child after the introduction of the MNP.

The packaging of the product, as used in the acceptability test, was not mentioned to be of major problem by the respondents. There were some suggestions however, especially from the KI health authorities to use different colours and a local name for the packaging.

**Conclusions:** The acceptability test results demonstrated that MNP is well accepted by the kharaz refugee camp population and the surrounding host community in terms of correct use, compliance, likeability, organoleptic properties (e.g. color and taste), and side effects.

**Recommendations:** The findings presented in this report postulate that the MNP intervention can be implemented in Kharaz refugee camp as well as in the surrounding host community. Further in depth study with the local community perception will be important to be done in order to understand their perception on the MNP. Further recommendations are as follows:

***Recommended regimen:***

Although most of the caregivers preferred a daily use of the MNP sachets, there were concerns about forgetting to give the MNP on a daily basis as well lose some sachets in the household. The need to have a semi rigid regimen is therefore important in order to cater for those who are likely to forget giving the MNP on a daily basis and to cater for wastage of MNP sachets. A 15 days semi -strict regimen is suggested whereby caregivers can be instructed to provide a sachet a day during the first 15 days of each month leaving the rest of the month to finish the sachets for those who might have forgotten to provide a sachet a day in the first 15 days.



### ***Micronutrient formulation:***

The micronutrient formulation of MNP should avoid iodine, due to the fortification of salt with iodine and due to the origin of the population coming from Somalia having high iodine levels. In addition, iodine deficiency prevalence is low in Yemen. Annex 1 shows the recommended formulation.

### ***Name and package design:***

A local name “Dheef” was suggested for the MNP which is a Somalia equivalent name for micronutrient and vitamins. The name “Micronutrient” has been translated to Arabic to cater for the Arab speaking population. There was no name suggestion for the MNP from the Arab community due to lack of focus group discussion .. The packaging design and colour is attached in the annex.

### ***Intervention roll-out:***

When the MNP is introduced there will be need to sensitize the community through the community elders, health committees and the ground council.

The Somali community is an oral society and although there were no rumours associated with the MNP, a slight misinformation can have adverse effects on the MNP intervention. There will be need for careful planning for the intervention and include all the stake holders from the beginning. The grand council, health committees, local health staff are very important to be involved in the implementation process.

A sensitisation campaign should be set up at least two weeks before the intervention. Frequent messages and sensitisation campaign will also be important to be done during the intervention. The sensitisation can be done through use of posters with the local language as well as public announcements using microphones. Special attention should be paid on how to use the MNP, what their benefits are, potential side effects and how to manage them and information to avoid sharing. The existing community health workers need to be involved in the community mobilisation as well.

The distribution of the MNP should be done with the blanket distribution of WSB in the health facility. And in the event that the blanket distribution of WSB stops, the same staff should continue to distribute the MNP in the same way at the SFP department. A specific number of blocks should be served per day in order to avoid overcrowding and women going back without the MNP.

The distribution channel of the MNP to the host community should be carefully studied with at least one to two staff responsible for the distribution and monitoring of the MNP within the host community.

### ***Monitoring and evaluation:***

Each CHW should be responsible of monitoring the MNP use in his/her blocks of work. Similar staff should be involved in the monitoring of the local host communities. UNHCR newly developed Operational Guidance on the use of FSP in refugee setting should be followed to design the M&E component.

A nutrition and anaemia survey should be carried out in mid term intervention and end of the intervention in one year.(date to be determined).

## 1.0 INTRODUCTION

Anaemia, as demonstrated by the latest nutrition and anaemia survey (July 2010) remains a major public health problem affecting 58.9% (95% CI: 53.2-64.4) and 64.5% of the children in Kharaz refugee camp and the surrounding host community respectively. Stunting prevalence in children aged 6-59 months (HAZ <-2) was also found to be 22.0 % (17.4 - 27.3) and 34.2 % in Kharaz and surrounding host community respectively.<sup>2</sup>

In an attempt to address the problems of anaemia and improve the micronutrient status of children aged 6-59 months, UNHCR is proposing to use micronutrient powders as a blanket intervention. The intervention was chosen based on a needs assessment conducted using a newly developed tool for selecting the appropriate food supplementation product to use in refugee settings. In order to ensure that the target population accepts the product, understands its purpose and uses the product as intended, UNHCR will conduct an acceptability and perception study. If the product is found to be acceptable, results from the acceptability test will be used to design a large-scale distribution programme to all eligible children with a culturally appropriate, context-specific communication campaign to ensure proper use of product and high adherence and acceptability. The proposed acceptability study will be coordinated by UNHCR and target children aged 6-59 months and their mothers in Kharaz camp and surrounding villages as well as the community at large (health workers, opinion leaders, fathers, and others).

## 1.1 CONTEXT BACKGROUND

UNHCR in collaboration with the government of Yemen re-established its activities in 1992 after the influx of the large Somali refugees, asylum seekers and other populations outside the refugee camps in order to provide basic humanitarian assistance and support that is aimed at attaining durable solutions. As of April 2010, a total of 237,000 refugees were being assisted and supported in Yemen. While the majority of the refugees are Somalis, smaller populations of Eritrean, Ethiopians and Iraqis also exist. The refugees stay mainly in urban settlements in Yemen while an estimated 17,808<sup>3</sup> refugees stay in Kharaz refugee camp. In 2009, more than 48,000 new arrivals arrived at the shores of Yemen, the majority of whom moved to the urban areas where there is already limited resources and hence an increased strain on the government.

Kharaz camp and surrounding villages are located in the Lahaj Governorate in a valley west of Aden in the southern part of the Republic of Yemen. The camp was built between 2000 and 2001. It is an open camp where most of the refugees depend on food aid and other livelihoods sources are very restricted. During summer when the climate is very hot, most of the population moves to Sana'a, or to the urban areas of Aden, where they try to find opportunities for earning their living. In addition to the Kharaz camp, UNHCR is operating a reception centre for new arrivals at Mayfa'a, east of Aden.

The area of Kharaz is a desert valley surrounded by hills and due to its isolated location and hot climate, especially during the long summer season, the income generation opportunities are really limited. Currently, the camp consists of 71 blocks built with cement, and about 25 shelter units, Each block has a water distribution point and a garbage collection point. The camp also has 400 out-shelters constructed with bushes, plastic sheets and clothes and over 71 temporary tents which accommodate continuous new registered arrivals over recent years due to the renewed fighting in Somali. UNHCR is

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<sup>2</sup> UNHCR 2010 Nutrition and Anaemia survey report

<sup>3</sup> UNHCR Data reports

currently planning to build additional blocks of shelters to move the refugees from the bushes.

Over 17,000 refugees live in the camp and about 1,500 Yemenis in the surrounding villages. Kharaz camp shelters Somalis and Ethiopians. Somalis are granted refugees status by the Yemeni Government. Yemen is party to the 1951 convention and its 1967 Protocol and the Government recognizes Somalis as refugees on *prima facie* basis, in accordance with the definition contained in the 1969 Organisation of African Unity (OAU) convention on refugees. Ethiopians on the other hand are not automatically considered as refugees and are interviewed first before being recognized according to their request. It is therefore important that the cultural and background differences of the communities in the camp as well as those in the surrounding villages are considered in order to effectively implement the proposed micronutrients powder (MNP) programme in young children aged 6-59 months.

## 1.2 NUTRITIONAL CONTEXT

From the recent nutrition survey to the survey done in 2009, all show high prevalence of anaemia in both the refugee camp and in the surrounding host community and in all target groups as shown below. All these figures surpass the 40 % WHO threshold defining a problem of high public health significance and thus making anaemia a high priority to tackle. In a parallel malaria survey (2009), the prevalence of malaria that is a major contributor of anaemia in developing countries was found to be very low in all the survey sites with a cumulative prevalence of about 1.3%<sup>4</sup> It is noteworthy that the survey was carried out during the low transmission period of May to June.

Vitamin A supplementation campaigns are done twice per year in the refugee camp. This is a three days survey that covers all the blocks in the camp and gives the capsules to all the children under five. The dosage of Vitamin A are as follows:

- Children 0-6 months =50,000IU
- Children 6-11 months =100,000IU
- Above one year =200,000IU

It is however important to note that this campaign is not done in the surrounding villages.

The high levels of anemia and high dependence on food aid has led to the recognition that food aid rations used in these camps have not been sufficient to meet the nutritional and micronutrient needs of those receiving the rations, especially the young children, who are the most vulnerable to deficiencies. The food ration given is as shown below. Additional supplements are also given to pregnant and lactating women and children under five years. This includes WSB which is given to lactating and pregnant women and children under five years and tuna fish for children 6-36 months. However tuna fish has not been supplied in the last two months. A total of 2400 grams of WSB pre mixed with 300 grams of sugar and with separate 300 grams of oil per child per month is currently given on a biweekly basis. The mode of distribution of the supplements is however poor with all the blocks called at once for collection. This has created overcrowding and subsequently resulted to some target groups not collecting the supplements due to long waiting times and overcrowding. On the other hand preliminary visits to the distribution site had shown limited human resource, lack of waiting space, and complete lack of orderliness.

From the table below it is evident that the refugees consume below the daily requirements in vitamin A, iron and Vitamin C that are important components for blood formation. This, along with the results from recent nutritional surveys, has led to the establishment of the

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<sup>4</sup> UNHCR/ Mentor (2009) Malaria and Anaemia survey Basateen and Kharaz camps Yemen

UNHCR anaemia control strategy that is aimed at providing a suitable intervention in order to reduce the prevalence of anaemia and other micronutrient deficiencies among young children.

**Table 1 General Food distribution**

Ration contents	Daily ration g/person/day	Energy kcal	Protein g	Fat g	Calcium mg	Iron mg	Iodine µg	Vit. A µg RE	Vit.C mg
WHEAT FLOUR, WHITE	300	1,050	34.5	4.5	45	3.5	0	0	0
RICE, POLISHED	150	540	10.5	0.8	14	2.6	0	0	0
PULSES	60	205	14.8	0.7	33	2.6	1	27	1
SUGAR	20	80	0	0	0	0	0	0	0
SALT	5	0	0	0	0	0	300	0	0
OIL, VEGETABLE	25	221	0	25	0	0	0	225	0
<b>Ration total</b>	<b>560</b>	<b>2,096</b>	<b>59.8</b>	<b>31</b>	<b>92</b>	<b>8.7</b>	<b>300</b>	<b>252</b>	<b>1</b>
% of requirements supplied by ration		<b>100%</b>	<b>114%</b>	<b>77%</b>	<b>20%</b>	<b>40%</b>	<b>200%</b>	<b>50%</b>	<b>4%</b>

**Table 2 Nutrition and Anaemia surveys results from 2008-2010**

Name of camp	Date (month and year) of survey	Anaemia In Children (6-59 months)		Anaemia In Non pregnant Women (15-49 years)		Acute Malnutrition* In Children (6-59 months)		Stunted In Children (6 months): Height-for-Age Z score < -2.5
		Severe (Hb <7.0 g/dL)	Total (Hb <10.9 g/dL)	Severe (Hb <8.0 g/dL)	Total (Hb <11.9 g/dL)	SAM: Weight-for-Height Z score < -3 SD and/or oedema	GAM: Weight-for-Height Z score < -2 SD and/or oedema	
Kharaz*	July 2010	2.7% (2.2-3.2)	58.9% (53.2-64.4)	0.9% (0.2-3.2)	48.4% (41.8-54.7)	1.7% (0.7 - 4.0)	8.7% (5.9 - 12.5)	22.0% (17.4 - 27.3)
Surrurrounding host commiunity*		2.8% (1.1-7.1)	64.5% (56.4-72.0)	0.0%	54.8% (46.1-63.2)	1.4% (0.4 - 5.1)	10.0% (6.1 - 16.1)	34.2% (26.2 - 43.2)
Kharaz**	May-June 2009	8.8%	77.9%	No data	No data	0.5% (0.2 - 1.2)	7.2% (5.4 - 9.5)	22.0% (18.2 - 26.3)
Surrurrounding host commiunity**		6.2%	73.0%	No data	No data	1.0% (0.3 - 3.5)	9.9% (6.5 - 14.8)	23.6% (18.3 - 29.9)
Kharaz**	January 2008	No data	No data	No data	No data	0.7% (0.1- 1.3)	6.5% (3.7- 9.4)	16.5% (912.3 - 20.7)
Surrurrounding host commiunity**		No data	No data	No data	No data	0.0%	13.6% (8.5- 18.6)	23.1% (18.8-29.4)

\*WHO 2006 reference used. \*\*NCHS Reference 1977.

## **FACTORS ASSUMED TO CONTRIBUTE TO THE MICRONUTRIENT DEFICIENCIES ARE AS FOLLOWS<sup>5</sup>:**

- Poor food diversification
- Lack of fortified food
- Limited access to fresh products and very little opportunities for access to markets or livelihoods
- Frequent disease outbreaks
- Poor infant and young child feeding practices
- Poor water and sanitation facilities
- Limited nutritional program coverage
- High tea consumption and wheat based diet (high phytate and polyphenol/tannin content of the diet).

### **1.3 BACKGROUND OF THE STUDY**

Refugees in the camp are predominantly dependent upon food aid which is provided in monthly food distributions from WFP. There are also limited sources of other income in both the refugee camp as well as the surrounding areas. The general ration, while providing sufficient energy according to international standards does not provide the sufficient micronutrient requirement for growth and development. The lack of a fortified food in the general food distribution also compound micronutrient deficiency. The nutrition and anaemia surveys over the last three years have shown high levels of anaemia among children 6-59 months as well as women of reproductive age both in the refugee camp as well as in the surrounding host communities. Anaemia is also high in both settings and in all target groups exceeding the WHO threshold of 40%. The malnutrition prevalence figures are serious in both settings. These factors therefore lead to the decision to provide a food supplement product based on a need assessment conducted using a newly developed tool for use in refugee settings.

In order to ensure that the target population accepts the product, understands its purpose and uses the product as intended, this acceptability and perception trial was conducted between 3<sup>rd</sup> August to the 8<sup>th</sup> of September 2010. The finding of this trial will be used to design a large-scale distribution programme to all eligible children with a culturally appropriate, context-specific communication campaign to ensure proper use of product and high adherence and acceptability

### **1.4 FOOD SUPPLEMENTATION PRODUCTS (FSP)**

Micronutrient powders (MNP) are used to fortify foods after preparation, just before consumption, to ensure an adequate intake of micronutrients essential for bodily functions, growth, immunity, productivity, and prevention of mortality among different population subgroups. Originally, micronutrient powders (also known as Sprinkles<sup>TM</sup>) were developed to treat iron deficiency anemia among young children, as they are unable to swallow tablets, and because syrups stain teeth and are too bulky to transport and store<sup>6</sup>. MNPs are packaged in single-dose sachets. The contents of one sachet should be mixed with an individual meal of semi-solid or solid foods that is ready for consumption. One dose for one child for one day contains one full recommended nutrient intake (RNI) of vitamins and minerals in one gram of powder. The powder is white and tasteless. Upon addition to certain foods, there may be a slight change of color (grayish or yellowish), depending on which micronutrients are in the powder and in what form. The micronutrient

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<sup>5</sup> UNHCR (2010) Nutrition and Anaemia survey

<sup>6</sup> Zlotkin SH, Schauer C, Christofides A, Shariieff W, Tondeur MC, Hyder SM. (2005) Micronutrient sprinkles to control childhood anaemia. PLoS Med

formulation of the micronutrient powder to be used in the acceptability trial is shown in Annex 1.

The MNP used in this trial was donated by DSM from a programme being conducted in Kakuma refugee camp (Kenya) and is composed of 16 vitamins and minerals (iron, zinc, iodine, copper, selenium, vitamins A, B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>6</sub>, B<sub>12</sub>, C, D, E, K and folic acid), in line with WHO/WFP/UNICEF statement on the need to provide micronutrients to populations affected by an emergency<sup>7</sup>. The amount of certain micronutrients can be reduced and adapted to be used in the Yemen context depending on the supplementary foods and the adequacy in the general food distribution in providing the required micronutrients.. For example, the amount of vitamin A and iodine can be reduced when vitamin A-fortified cooking oil, iodized salt and fortified blended foods are also provided. Therefore, after the acceptability trial, the micronutrient formulation may be altered.

Despite the fact that the concept of home fortification was tested in several trials and found to be acceptable and effective at reducing anaemia prevalence in young children<sup>8</sup>, the concept is still new in most refugees settings. There is a need to collect information on the acceptability and usage of the product among families, the local population and authorities before the distribution programme is rolled-out. It is in this view that an acceptability trial is proposed to be conducted before any intervention takes place.

## 1.5 TEST SITE

The MNP acceptability trial was conducted in Kharaz refugee camp and surrounding villages, Yemen. Due to the different background settings of the refugees and the communities in the surrounding areas, a parallel acceptability trial was conducted to best capture any potential differences in acceptability.

The refugee camp is set in a well organised system with blocks of about 25 households each. All households have specific address number that consist of the block and the household number. There are about 71 blocks in the camp, however there is a small group yet to be allocated the permanent shelters and are in tents that are commonly referred to as the “bushes”

In the surrounding villages, there were about seven villages that are scattered around the refugee camp. The number of households in these villages vary with the largest village being Huweirab village that is the closest to the refugee camp as compared to the other villages

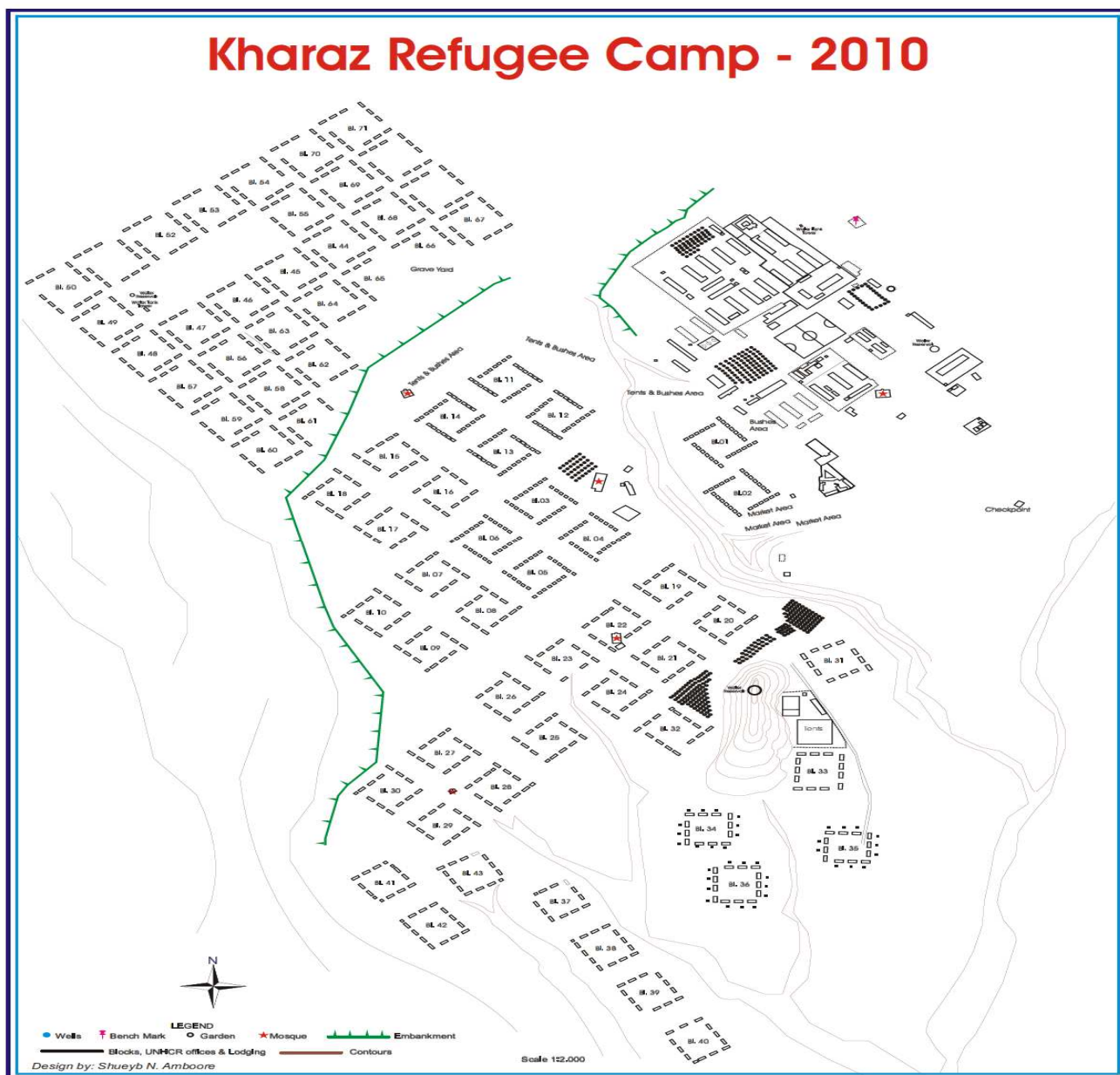
There is a trained community health worker per 10 blocks, who are refugee incentive staff working for CSSW and are fully engaged in public health activities in the camp. Some of the community health workers are regularly assigned to support the daily medical activities in the camp’s health centre. During the time of this study, the community health workers were actively involved in organizing focus group discussions and carrying out the household (HH) questionnaire inquiries. There was however no such organization in the host communities and the trial used the refugee camp community health workers for the acceptability trial.

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<sup>7</sup> Preventing and Controlling Micronutrient Deficiencies in Populations Affected by an Emergency. Joint Statement by WHO/WFP/UNICEF, 2006.  
[http://www.who.int/nutrition/publications/WHO\\_WFP\\_UNICEFstatement.pdf](http://www.who.int/nutrition/publications/WHO_WFP_UNICEFstatement.pdf)

<sup>8</sup> Systematic review and meta-analysis of home fortification of complementary foods. Kathryn G. Dewey, Zhenyu Yang and Erick Boy. Maternal & Child Nutrition. 2009 5 4, 283 - 321

Figure 1 Map of Kharaz Refugee Camp<sup>9</sup>



## 1.6 OBJECTIVES OF THE ACCEPTABILITY TEST

### Overall Objective:

The overall objective was to assess the acceptability of using MNP as a possible home fortification strategy in children 6 to 59 months of age after four weeks of use.

### Specific Objectives:

1. To describe the population's perception of the product and acceptance of use of MNP
2. To explore barrier and facilitators local practices and cultural eating habits of the target groups' households
3. To find the most appropriate name, packaging, communication strategy and delivery system for distribution of MNP to the target population

<sup>9</sup> This map is only for the refugee camp and the map for the surrounding host community was not available

## 2.0 METHODOLOGY

### Study design

The study was designed as a community based acceptability trial with a sub sample of the population in the refugee camp and one village in the surrounding local population given the intervention and followed up for one month in order to get an understanding the community perception and acceptability of the MNP product.

The trial employed a number of research instruments using both qualitative and quantitative methods to understand the acceptability of the MNP. Research tools were used to assess the factors associated with the use and acceptability of the product. Positive aspects, barriers, cultural food eating habits, and underlying reasons for the acceptability results were also investigated.

### 2.1 TARGET POPULATION

The target group for the intervention is shown below in Table 3 below.

**Table 3: Characteristics of the target age group for FSP**

FSP	Characteristics	Comments
MNP	Aged between 6 and 59 months meeting the inclusion criteria	This group of children were identified through active finding of target group in the selected blocks and village.

There are two major sets of ethnic groups in the camp and the surrounding villages. The refugee camp is mainly inhabited by people of Somali ethnicity although few populations of Oromos and Eritreans also exist. Although the main group in the trial in the camp were of Somali ethnic group, the oromo group were also included in order to cater for the cultural variability within the camp.

On the other hand the surrounding host communities are of Arab ethnicity and are citizens of Yemen. The inclusion of the surrounding host community was mainly necessitated by fact that local communities have been having long term competing problems similar to the refugees and hence the need to include them in the interventions. The nutritional status of the host communities are worse than that of the refugee settings. The lack of adequate government support to the host communities also compound the dependency of the host community on the aid relief. Despite the fact that no relief food are provided to these host populations they benefit from other services like health care and water among others.

### 2.2 INCLUSION AND EXCLUSION CRITERIA FOR TARGET POPULATION:

#### Inclusion criteria:

- Age 6 to 59 months based on EPI cards, UNHCR registration
- Eating at least one complementary food a day in addition to breastmilk.
- Verbal informed consent from at least one caregiver on behalf of the child.
- Availability during the period of the test.

#### Exclusion criteria:

- Children aged from 6-59 months of age with Weight for height Z score (WHZ)  $\leq$  -2.0 using WHO Growth Standards or the presence of bilateral pitting oedema.
- Children with severe systemic illness warranting hospital referral.
- Congenital defects such as cleft palate or any illness likely to interfere with food intake.



- Children that are currently participating in any other trial
- Children receiving therapeutic care from anaemia.

### 2.3 SAMPLE SIZE AND SAMPLING

Sample size was calculated based on an assumed adherence of 50% (used as a proxy for acceptability in order to get a higher sample size), required confidence interval of 95%, 10% precision and a design effect of 1 (cluster sampling not used) using the formula shown below:

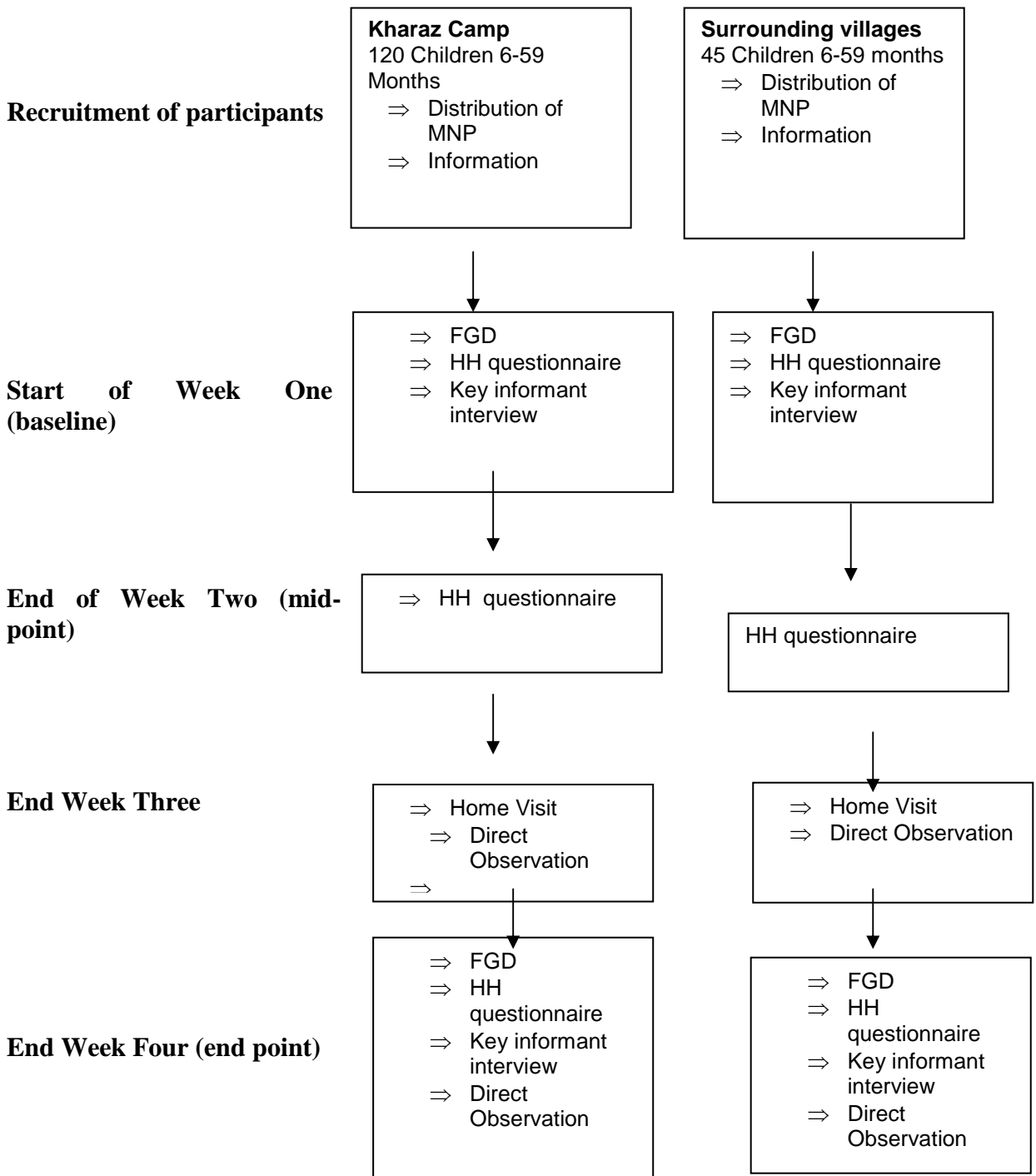
$$n = 1 * \frac{1.96^2 * (1-0.5) * 0.5}{0.1^2}$$

The sample size was increased by 20% in order to account for loss to follow up or withdrawals. A total of 120 children 6-59 months were therefore selected for the trial in the camp. The sample size in the surrounding villages was decreased to 45.

**Table 4 Sample size by each target group of the Acceptability Test**

NUTRITION PRODUCT	TRIAL SITE	TARGET GROUP	MINIMUM SAMPLE SIZE REQUIRED	MINIMUM SAMPLE SIZE REQUIRED + 20%
MNP	Kharaz refugee camp	Children from 6-59 months	96 children from 6 -59 months	<b>120</b> children from 6 -59 months
	Surrounding host community	Children from 6-59 months		45 children from 6 -59 months

**Figure 2 Algorithm of the MNP acceptability trial**



## **2.4 RECRUITMENT AND REPLACEMENT OF DISCONTINUING PARTICIPANTS**

Purposive sampling to capture important groups was done with seven blocks out of the 71 blocks in the camp and only Huweirab village was selected out of the seven villages in the surrounding villages.

An initial understanding of the camp settlement was therefore done before purposive sampling was done. The aim of the purposive sampling was to include the different ethnic groups and other important groups within Somali that was thought to have some cultural difference from the larger Somali group. Of concern to include in the trial in the camp were the Oromo and similarly capture Somali ethnic groups which include the Somali Bantus. An initial understanding of the camp settlement was therefore done before purposive sampling was done.

Assuming that there was one eligible child per household, that some of the households were absent and that some families may refuse to take part because of Ramadan, seven blocks were expected to provide the required number of children. After the selection of two blocks with the two ethnic interest groups to be included in the trial, the other five blocks were randomly selected..

Huweirab village was selected in the surrounding host communities. The selection of the village was based on the logistical feasibility, access and size of the village. Huweirab is closest to the refugee camp and is the largest settlement among the local community with the expected number of target children. Including other smaller villages or combining smaller villages was thought to attract unnecessary attention from other communities who might think they are excluded from a beneficial exercise.

The target groups were identified, through active target group findings in the selected blocks and village. Eligible children whose parents show a preliminary interest in being involved in the trial were invited for a preliminary screening for enrolment. Those meeting all eligibility criteria and consenting to participate were given a trial identification number. Age of the participants was confirmed from the health card and recorded.

The participants (mothers or family members of children) could decide to discontinue the test at any point without giving a reason for her/his decision. If known, the reason for withdrawal was indicated. Participants who discontinue were not replaced.

## **2.5 DOSE, SCHEDULE AND DURATION OF USE.**

The MNP was distributed in single-dose sachets and each caregiver was asked to provide one sachet a day to their child, mixed with a meal in an individual plate (at any mealtime during the day). A total of 30 sachets per child was given to the caregiver after fulfilling the eligibility criteria. Detailed instructions were given concerning the method of mixing with food, sharing of the food and possible expected side effects. The trial period took a period of 4 weeks starting from 10<sup>th</sup> of August to 8<sup>th</sup> September 2010 as shown below.

**Table 5: Dose, schedule and duration of use of the MNP**

FSP	Target population	Dose/recommended regimen	Preparation	Duration
MNP	Children 6-59 months	Daily regimen: 1 sachet per day	Mixed with the meal after cooking and the food is cool enough. The sachet should be mixed in an individual plate	4 weeks

## 2.6 INTRODUCTION AND DISTRIBUTION OF THE MNP

### Key meetings

Before the start of the acceptability trial, meetings with various partners, participants and stake holders were held. This included all the UN bodies and implementing partners in the refugee camp, grand council, block leaders both the female and male representatives, a few selected parents from the blocks of the trial and health staff. The purpose of these meetings was to inform about the study purpose and duration, and seek consent and full cooperation and participation.

Meetings with community elders in the surrounding host communities were not accomplished fully. Only four elders in the community were available for these initial discussions and efforts to meet all elders and parents did not materialise. Consent to go to the village was however given by the four sheikhs met at the initial planning stage.

### Training of the health staff:

Staff who participated in the trial were selected by CCSW and included both trained and auxiliary staff. Staff that will be involved in the initial implementation of the product were requested to be selected and thus staff were selected from Antenatal, growth monitoring, nutrition and community health workers departments. A total of 15 staff were selected for the trial which included 13 field staff, one data entry clerk and one supervisor. An equal number of male and female survey staff was recruited in order to maximize the use of both groups in cases where men are not allowed to interview women. Each staff was allocated a block while four staff were sent to the Huweirab village which was divided into Huweirab A and Huweirab B. Two staff conducted the assessment in each subsection of the village.

Training of teams was done by the Nutrition consultant. The training emphasized on how to add the MNP to the complementary foods, its dosage and administration. The training also touched on proper complementary feeding practices and continued breastfeeding. Other issues included health staff's tasks and responsibilities such as monitoring for quality control, household visits, follow-up, incentive for work, etc. Each health staff was provided with a flip chart containing information on how to use the MNP. In order to improve the quality of data collection, the staff were trained at least a day before a specific field work was undertaken. The training period ranged from one day to three days. The staff were thus trained at the start of the trial, the second week of household questionnaire, the third week of observation and the final week of the end point data collection.

### Nutrition education session with mothers and camp stake holders

The initial nutrition education sessions on how to use the MNP was given to a selected group of the mothers, block leaders and the grand council and the health committee. This initial education session was done at the CSSW health centre and done for two days in shift. Plastic cups were purchased and porridge was prepared at the kitchen of the hospital.

The survey coordinator demonstrated the method of mixing the MNP with the porridge and tested the porridge. Individual participants were then asked to repeat the demonstration in front of the class and subsequently all the participants were provided with a cup of porridge and one sachet to practice the mixing. Instructions on how to use the product and the dosage and the do's and don'ts were also stressed in addition to proper complementary feeding practices and continued breastfeeding.

A repeat training for all the parents was again conducted when the staff first reached the block or village. All the parents were gathered at a designated place and the demonstration of mixing the product with food and other instructions were given to the parents. The same instructions were again repeated during the eligibility enrolment at the household level. All caregivers were instructed to keep the empty sachets in their homes for the duration of the test.

The surrounding host communities could not be available for the initial product information and demonstration by the Nutrition consultant. Only two elders turned up of this. However subsequent demonstration to the parents were conducted at the village, by selected trial staff. All the mothers gathered at a particular point and demonstrations and information about the product was given. Subsequently, individual parents were further educated during the enrolment visit in the household.

#### Focus group discussion with different target groups

Baseline FGDs were conducted at the end of the demonstration with stakeholders, health staff and parents to help design the preliminary educational materials and key messages to give to the community regarding the product.

#### Distribution of the product

The sachets were distributed at the household level upon fulfilling the eligibility criteria. The trial staff moved from one household to the other and enrolled all the children eligible for the trial. Upon enrolment each care giver was given 30 sachets per child for the whole duration of the trial. Detailed explanation of the use of the product was again repeated at the household level.

## **2.7 DATA COLLECTION**

All selected children were monitored at the household level. The following four methods of data collection were used for the trial:

1. Focus group discussion
2. Key informant interview
3. Household interview
4. Direct observation

#### **Focus Groups Discussion (FGD)**

The Focus Group Discussions was conducted in small homogenous groups of respondents (maximum 8-10 persons per FGD). The FGD were conducted at two time points: at baseline and at end point. The groups involved in these focus group discussions were mainly parents (both of women and male) sets. The main topics for the FGDs were as follows:

1. *Feeding habits and child caring practices*: To know the eating habits of the households and the child caring practices (this was to complement what is already known by camp staff).
2. *Perception of intervention*: Perception on the organoleptic aspects (taste, smell, color...)
3. *Duration and distribution*: Opinion on the long-term duration of taking the nutrition product and the most appropriate distribution system

4. *Barriers to compliance/acceptance*; difficulties encountered, likeability and acceptability of the products (within HH and within community),
5. *Health benefits and knowledge*: their perception of potential benefits, appropriate use, sharing (and ability of the mother/caregiver to provide the product to the target child only), duration of use and whether they think the product is necessary for their children
6. *Packaging and name*: Suggestions about which packaging design and names would be appropriate (colour, images, language etc).

A semi-structured questionnaire was used for conducting the focus group discussion. The duration of each focus group discussion was between 45 min -1 hour and was conducted by the Nutrition consultant who also took notes. The trial supervisor helped facilitate the gathering of the groups to the venue and with the provision of refreshments. When there were language barriers anticipated, one of the team member who was fluent in that particular language was invited to help in translation. There were however no major language barrier as the Nutrition Consultant spoke Somali fluently.

The FGD with the host community could not be conducted. The community did not initially agree that their women be interviewed by a man and even after agreeing to be interviewed, they still could not come to the health centre for the FGD. Due to the complexity of the FGD, it was not feasible to send trial staff to conduct the FGD at the village.

## 2) **Key Informant Interviews:**

Checklists for in-depth interviews were constructed to be used for the key informant interviews. The interviews were held inside the CSSW health facility to ensure privacy. Each in-depth interview took around 45 min. The interviews were conducted with different key informants including health authorities, health staff (qualified and auxiliary staff), nutrition workers and community leaders to have an in-depth understanding of their perceptions of the MNP as a vehicle for preventing anaemia and micronutrient deficiencies, potential channel for the nutrition product distribution and their possible role in the nutrition product intervention.

After having a practical exposure of the purpose and instructions of use of the nutrition product, the issues that were covered were knowledge of the MNP, use of the MNP, problems encountered in using the MNP, changes observed in children after intake of the MNP, level of MNP acceptance and their opinion on the appropriate distribution system.

## 3) **Household Interviews:**

Household interviews were conducted at baseline, midpoint and end point. In cases where there were more than one eligible child in the household, each child was given a separate questionnaire. At baseline, the first perceptions of the caregivers were recorded. At the mid-point (after two weeks) and final household interview (after 4 weeks) visits, the following information was recorded:

- Information on how they use the nutrition product (which foods, effects on food, way to use it)
- Acceptability of the product (easy to use, likeability, impact on appetite/level of activity/playfulness, major difficulties...)
- Compliance: To count the number of full/empty sachets, lost sachets, shared sachets, sold sachets, portion of food used.
- Side effects: Presence of loose stools, vomiting, constipation, dark stools attributed to the intervention.
- Knowledge and understanding of the intervention.

#### 4) **Direct Observation:**

Direct observations were done during the third week of the trial with each team observing at least five households and reporting on how the product was used, including addition of the MNP powder, type of food prepared, storage of the product and feeding it to the child.

## **2.8 ANALYTICAL APPROACH**

### Analyses of qualitative data

The qualitative data collected was organized by topics to look across responses from all respondents in order to identify consistencies, differences and relationships, and were analyzed manually. Data triangulation was done by cross checking the quantitative data with the qualitative information in order to support cases and findings.

### Analyses of quantitative data:

Quantitative data was entered into Epi-Data and later transferred to SPSS version 16.0 for analysis. Data was cleaned by running frequency tables and looking for outliers and values that were out of the expected responses.

Compliance was calculated by counting the number of empty sachets at mid point and at the end point. Caregivers were instructed to keep the empty sachets however it is inevitable that some caregivers will throw out or lose some sachets (empty or full). Additional analyses were therefore conducted on those who had not thrown away or lost any sachets. Compliance was thus classified as :

- Very Low adherence ( $\leq 25\%$ ) – Consumed number of MNP less or equal to 25% at mid point and at end point.
- Low adherence (26%-49%)- Consumed number of MNP sachets between 26% and 49% at mid point and at end point.
- Adequate adherence (50%-74%)- Consumed number of MNP sachets between 50% and 74% at mid point and at end point.
- High adherence ( $\geq 75\%$ )- Consumed number of MNP sachets above 75% at mid point and at end point.

## **2.9 THE STUDY MANAGEMENT**

The study was coordinated by a consultant, one of the authors (Ismail Arte Rage), of ENN through the ENN-UNHCR anaemia reduction programme collaboration. The technical support was provided by another ENN consultant based in London (Melody Tondeur) and UNHCR Senior Nutrition Officer based in Geneva (Caroline Wilkinson). The two ENN consultants exchanged draft questionnaires, developed the protocol and other trial tools. The trial coordinator together with UNHCR medical coordinator (one of the authors, Melaku Maru ) and CSSW community health coordinator (Hussein Odowa ) provided the supervision of teams in the field. Teams were continually supervised and at least two households were observed through in every supervision.

Teams met with the trial coordinator every morning before departing to their respective trial site. These regular meetings provided avenues to discuss the challenges encountered during the previous day, comment on the previous filled questionnaires and any other important observations. In the surrounding host communities where there were security restrictions for the trial coordinator and UNHCR staff, the CSSW supervisor coordinated activities related to the trial

Staff incentives, supplies and all logistical arrangement were provided by UNHCR. In some instances CSSW provided transport for the field teams to their blocks. Meeting

rooms, and FGD and training venues were also provided by CSSW.

## **2.9.1 ETHICAL CONSIDERATIONS**

A series of meetings were held with Ministry of Health both in Sana'a as well as the Lahaj Governorate. The purpose of the study was explained and consent to conduct the training was asked. No letter was written to the MOH, however verbal consent to conduct the trial was obtained both in Lahaj where the refugees are based as well as the MOH head office in Sana'a. The ministry of health Lahaj initially had assigned one staff to work with the trial team as a sign of the cooperation and for capacity building. This was however not possible at the start of the survey as the selected staff was engaged in other important activities.

Consent was also sought from the community leaders in both Kharaz and the surrounding host community. The trial coordinator met with the ground council of the refugee camp and two sheikhs from the local community. The purpose, duration, and the methodology of the trial were explained to the elders and their consent was sought. Similar meetings were set before the start of the trial with other actors. These included among other the implementing partners in the camp, refugee health committees and health staff.

Upon arrival at the household the consent of the caregiver was sought after explaining the purpose of the trial, the duration, possible side effects and freedom to participate. Only after the consent was obtained from the caregiver, was the other eligibility questionnaire asked and the child enrolled if he/she fulfilled all the conditions.

## **FUNDING**

This study was funded by UNHCR. DSM donated the supply of MNP used in the trial and ENN provided the consultant payment

## **LIMITATIONS**

The lack of standardised acceptability trial tools was a major challenge and considerable time was taken to develop the tools and share with colleagues for comments.

The security restrictions in the surrounding host communities were a major limitation. The trial coordinator could not supervise the teams due to the restrictions. Due to the host community refusing to come to the health facility for the FGD, the FGD could therefore not be conducted for the host community and it was hard to know their perception on the product and packaging. The lack of community health workers from the local community was also a major hindrance and using the Somali health staff had some challenges due to the language and cultural differences.

Apart from the security restrictions of going to the host communities, there were also cases when the trial coordinator and UNHCR staff were asked to remain indoors within the UNHCR compound, which added some constraints on the supervision of the teams. As a result, there were three days when supervisor visits could not be conducted.

The lack of community health workers from the local community was also a major hindrance and using the Somali health staff had some challenges due to the language and cultural differences.

The period of the trial was not the most appropriate. During the Ramadan and in the summer, a high number of refugees move to the nearby major cities. In addition, during Ramadan, the day is more or less converted into a night and vice versa. Therefore, during



interviews, especially in the host community, the morning was a difficult time as most of the people were sleeping and in the evenings most were busy preparing the breakfast. Conducting the household interviews in the host communities therefore took much longer than the refugee camp. Also, the trial was cut short by three days due to the approaching Idd celebrations that take more than a week to ensure not to lose the subjects as well as the staff.

Lastly, there was an increase in the flies population in the camp towards the end of the trial and thus increased cases of diarrhoea. Although the majority of the caregivers did not relate the diarrhoea to the MNP, some of them did.

### 3.0 RESULTS

#### 3.1 SAMPLE CHARACTERISTICS

A total number of 135 and 45 children were enrolled in the camp and the surrounding host community respectively. There were six and four drop outs at the end point both in the camp and in the surrounding host community respectively. Except for one woman in the surrounding host community who refused to give the product to the child the rest of the drop outs were missed at the household during the last visit. In the refugee camp six blocks of Somalis and one block of Oromos were captured. The surrounding host community were local Yemeni populations leaving around the refugee camp.

The sex ratio was well distributed among gender in the trial subjects. The proportion of female subjects were 52.8 % while the proportion of male was 47.2% for the combined group. The mean age was 33.7 months for the combined group with a range of 6 months to 59 months.

97.8% of the combined respondents in both the refugee camp and the surrounding host community were mothers of the children in the trial. A fewer proportion of the respondents (2.2%) were other relatives.

The table 5 below shows the number of KI, FGD and household observation visits done in the camp and in the surrounding host community.

**Table 6 Number, type and timing of FGDs, KIs and direct observations**

Target Groups	Start/Baseline	Mid point	Final
FGD- Women	4	0	4
FGD –Men	1	0	2
KI- Community Leaders	2	0	2
KI- Community Health Workers	2	0	2
Direct observations (Home visit)	--	45*	--

*\*apart from the direct household observation all the other FGD and KI did not involve the surrounding host community.*

#### 3.2 CONTEXTUAL INFORMATION

##### Eating habits of the households:

The majority of the population in the camps relies on food aid. The sale of food is high in the camp. The ration card surety is common in the camp where refugees borrow money from specific traders and deposit with them the ration card. The trader then collects the food at the end of the month. This money is not sufficient enough to buy food for the rest of the month and many refugees have been trapped in this racket. However the majority of the families eat about two-three meals per day and vitamin rich foods are eaten once in a

week. There is usually once a week a market day in the camp where both refugees and locals exchange and bring items for sale. The majority of the women explained that families try to eat meat and other vitamin rich vegetables on Fridays.

Typical households consume tea with pancake (loxo) in the morning with oil and sugar and mnsed with black tea for breakfast. For lunch, it is mainly rice with some onions and potato while many households consume pancake (loxo) for supper.

The way the food is eaten by family members in a household is quite similar between households with the children eating together and the parents eating together. However larger families might have a higher number of servings with smaller children eating together, older ones eating together, and parents eating together. In many cases the husbands are not at home and the mother and the children eat together. In cases where there are visitors the father is served with the visitors if they are male visitors and with the mother for female visitors.

Before the start of the trial, UNHCR had provided each household in the camp with five plates, five spoons and five cups for use in the household. Accordingly, at the baseline interview, 97% and 91.1% of the mothers in the camp and in the surrounding host villages respectively, mentioned that they would have an individual plate to mix the MNP for the child. In the focus group discussions, many mothers mentioned getting a separate plate to feed the MNP would not be a problem. Eating in individual plates however is seen as a sign of isolation. In the Somali culture, they used to strictly isolate people suffering from TB and used to serve them in different and specific plates. Although this practice and belief has now changed, there is still some level of stigma associated if one is served food alone without any reason. Nevertheless, a few of the mothers mentioned that their child did question why they were served separately.

In addition, there was no known superstitions that was mentioned during the trial except for one key informant who mentioned that the children were not taken to sleep on a full stomach at night and that there were beliefs that this might affect the health of the child. This message could not be verified in subsequent FGD and KIs.

### 3.3 ACCEPTABILITY

The caregivers of the children were asked whether their child liked the MNP and the majority answered in the affirmative as shown in the table below. A slight increase in likeability could be observed from the mid point to the end point in both settings.

#### 3.3.1 LIKEABILITY

**Table 7 Likeability of MNP**

% caregivers of children taking MNP	Kharaz refugee camp		Surrounding host community	
	N	Mid-point	N	End
Mid point	135	90.4% (122)	45	90.9% (40)
End point	127	97.6%( 124)	41	97.6 (40)

Some of the general comments made by the mothers to gauge the likeability was that they were reminded by the children to add the MNP into the food:

“My child always asks mum you have not added the medicine into my food” and “i have to cheat him that i cooked in the food during the other meals, since we are only told to give one sachet per day in one meal of our choice”.

Similarly the mothers themselves said they were motivated to give the MNP when they saw improvement in their children. Some mothers stated that the child activity, happiness and appetite had been greatly improved. One man in one FGD stated the “ i have never heard of my son saying, father am hungry before the introduction of this medicine and now you hear him say Dad am hungry”. A post trial visit to the camp also showed a high demand of the MNP product by the households that had previously used the product with a number of women coming to the health facility and asking when the MNP will be brought back next. Moreover, the health staff working on the trial reported that they were being asked about the product daily and when it will be brought back.

It is however worth mentioning that there was a small percentage of children that did not show likability to the product. A few women stated that their children dislike drugs and the naming of the product as drug has discouraged them and they showed some strong dislike. At least two women stated that they were hiding from the child when adding the MNP to their food otherwise the child was likely to refuse. One woman suggested a name and distribution point change would improve the likeability of the product for her child.

**Participant's doubts and intention to stop the MNP**

The table below shows the doubts and intention to stop the MNP. \the majority of the households had no worries about the nutrition product and had no intention to stop using the product. The responses were similar at mid point and at the end point.

**Table 8 Participant's doubts and intention to stop the MNP**

Indicator	Trial site	% caregivers of children taking MNP		% caregivers of children taking the MNP	
		N	Mid-point	N	End
Participants without any worry about using the MNP	Kharaz refugee camp	135	93.3% (126)	12 9	96.9% (125)
	Surrounding host communities	45	91.1% (41)	40	90.0% (36)
Participants that would prefer to stop taking the MNP	Kharaz refugee camp	135	5.9% (8)	12 9	3.1% (4)
	Surrounding host communities	45	8.9% (4)	40	10.0% (4)

The majority of the mother reiterated that they were motivated by their concern for the health of their child and that was important for them to continue providing the MNP. Similarly the trust of the local health care workers and the repeated education messages on the MNP use and preparations and the frequent home visits were also narrated as the positive factors that have influenced the continuous use of the product. They said the level of concern shown by the health care workers towards the product had also removed any worry on the product or willingness to stop taking the product.

The few mothers that preferred to stop the MNP stated that the MNP had no positive effect as well as other reasons. It is important to note that apart from one woman in the surrounding villages who out rightly returned back the MNP, there were no other major refusal noted. This woman stated that she had developed some suspicion over the product and did not want to give it to her children. She however did not specify the suspicion and it was also not possible for the team to visit her again.

Some women also stated that they stopped giving the MNP due to sickness like diarrhea which they attributed to the MNP. A few women also raised suspicion over why only a few blocks were selected and not the rest of the camp

### **How often child finishes the whole food mixed with the MNP**

The table 9 below shows that a high number of the children either finished their food every time or almost every time. The number of children who had never finished their food was very small.

**Table 9 How often the child finishes the whole food mixed with the MNP**

	% caregivers of children taking the MNP (mid-point)		% caregivers of children taking the MNP (end)	
	Kharaz refugee camp (n=135)	Surrounding host community (n=45)	Kharaz refugee camp (n=129)	Surrounding host community (n=41)
Every time	69.6% (94)	22.2% (10)	63.6% (82)	43.9% (18)
Almost every time	28.1% (38)	71.1% (32)	34.1% (44)	56.1%(23)
Sometimes	0.7%(1)	4.4%(2)	0.8%(1)	0%
Never	1.5% (2)	2.2%(1)	1.6(2)	0%

### **Child's reaction to the food with the MNP added**

The table below shows how the children reacted to the food to which the MNP was added. 60.7 % (n=83) and 88.9% (n=40) of the caregivers stated that they added the MNP while the child was watching. Overall, the reaction of the child was not a concern.

**Table 10 Child's reaction to the food with the MNP added**

	Mid point		End point	
	Kharaz refugee camp (n=83)	Surrounding host community (n=40)	Kharaz refugee camp (n=106)	Surrounding host community (n=37)
Very good	84.3% (70)	25.0% (10)	75.5% (80)	62.2% (23)
Good	14.5% (12)	65.0% (26)	23.6% (25)	37.8% (14)
Bad	1.2% (1)	7.5% (3)	0.9% (1)	0%
Very bad	0%	2.5% (1)	0%	0%

Half the women said they did not add the MNP into food while the child was watching for fear of refusal. They said that their children fear drugs and the name of drug creates fear in the child. Although there were no taste changes in the foods to which the MNP was added, the child could develop some phobia. As a result, they opted to add the MNP while the child was not watching. It is however important to note that a high number of women said their children liked the MNP and that they actually did remind them to add the MNP to the food when served.

### 3.3.2 EASE OF USE

The table below shows the number of caregivers who said the MNP was easy to use.

**Table 11: Number of respondents reporting that the MNP was easy to use**

	% Caregivers of children taking MNP		
	Baseline	Mid-point	End
Kharaz Refugee camp	97.7% (130)	97.8% (132)	97.7% (126)
Surrounding host community	97.8% (44)	100% (45)	100% (41)

The majority of the women attributed the ease of use of the MNP to the continued refresher and several practical sessions before the start of the trial.

“We have been given several demonstrations on how to use MNP and we were even shown repeatedly on where to tear off the MNP”

The responded who reported that the MNP was not easy to use could not be captured in the FGD, however information like inadequate information not given to them as well as nobody to read the information on the pack for them were some of the responses collected from the household interview.

### Food preparation and effect on food

The table below shows the mode of food preparations when adding the MNP. There was a minimal number of women who reported that they added the MNP to a drink but this was rectified after the interview and there were no cases reported in the end point. The majority of the respondents reported that the way they prepared the food and added the MNP was they way they were given instructions by the trial team on how to prepare the MNP.

There was a data collection error which was realised across all the teams. They have understood the option of “directly from the sachet” as implying tearing off the sachets and directly adding to the child’s food . The variable option of “ Added to individual cups or plates of food” and “Directly from the sachet into Individual child’s food” should therefore give similar results and a cumulative of the same will provide the proportions of caregivers who put the MNP sachets into the child’s individual food. This was realised after the data entry and upon enquiries showed that the teams misunderstood the option. There has not been any situation where the MNP was eaten directly eaten from the sachet.

**Table 12: Food preparation and MNP use**

	Mid point		End point	
	Kharaz refugee camp (n=135)	Surrounding host community (n=45)	Kharaz refugee camp (n=126)	Surrounding host community (n=41)
Added to family or communal pot of food	0%	0%	0%	4.9% (2)
Added to individual cups or plates of food	29.6% (40)	15.5% (7)	20.9% (27)	4.9% (2)
Added to individual drinks	2.2% (3)	6.7% (3)	0%	0%
Directly from the sachet into Individual child's food	67.4% (91)	77.8% (35)	75.2% (97)	90.2% (37)
Other	0.7% (1)	0%	1.6% (2)	0%

The majority of the FGD participants explained that they noticed a change in colour when the MNP was added to the food. This colour was explained as yellowish. There was however no reported information on the change of taste and texture. A few women explained that there was a taste like that of ferrous sulphate drugs. They explained the taste was an after taste that was realised when the food was already taken.

The majority of the respondents reported that the MNP was added to rice (84.4%), pancakes (48.3%) and porridge (46.7%). In the FGD discussions most of the women also stated the same types of foods to add to the MNP and said they mixed the MNP with whatever was available in the household.

Direct observations in the household showed that 60.5 % of the households preferred to give the MNP during lunch while 36.6% gave it at breakfast and a smaller percentage of 2.9% preferred to give it during dinner. These observations showed that the MNP was added to a small portion of the food in a separate plate and when the child finished the food mixed with MNP, the child joins the other older children in eating the food. While a similar number of households had shown that the food was added to a small portion of the food and given to the child to eat on a separate plate .

### 3.3.3 ADVERSE SIDE EFFECTS

**Table 13: Reported adverse side effects of using MNP**

	% children using MNP, as reported by caregivers (mid-point)		% children using MNP, as reported by caregivers (End)	
	Kharaz Camp (n=135)	Surrounding villages (n=45)	Camp (n=128)	Surrounding villages (n=41)
Diarrhea	17.2% (23)	4.4% (2)	7.0% (9)	19.5% (8)
Changed their feces color	49.6% (66)	53.3%(23)	18.6%( 24)	22.0% (9)
Constipation	11.3% (15)	2.2% (1)	0%	2.4% (1)
Vomiting	7.5% (10)	0%	2.3% (3)	0%
Nauseas	4.5%(6)	2.2%(1)	2.3%(3)	0%
Abdominal discomfort	7.5%(10)	0%	3.9% (5)	0%
Another health	3.8%(5)	2.2%(1)	2.3% (3)	0%

The most common reported side effect observed was a colour change in the stool with the change in stool colour reducing with the continued use of MNP and the incidence of reported stool colour reducing by half at end point. The majority of the respondents described the colour of the stool as being brown (32.2%) and blackish (60.0%) for the combined trial sites.

It is noteworthy that there was a high number of flies in the camp and surrounding host community during the time of the trial and that the prevalence of diarrhoea was high. A few respondents associated the diarrhoea problem with the MNP. 2.2% of the respondents said they attributed the side effect problems to the MNP during the household interviews.

During the FGDs and KI interviews, the majority of the respondents reported that they did not attribute the side effects to the MNP. The majority of the women in the camp are familiar with the side effects of ferrous sulphate (given through the iron pills) and hence knew the stool colour change was due to the MNP which contains iron.

### **Perceived benefits and knowledge of the intervention**

Tables 14 and 15 show the perception of the caregivers about their child activity and appetite. A high number of respondents described the level of activity and appetite as ‘very good’ or ‘good’ at the mid point and these figures increased at the end point interview.

A similar reaction was observed during the FGDs and the KI interviews. The majority of participants described to have seen a change in their child’s activity and appetite after the introduction of the MNP. They described the appetite as one of the main improvement they saw when using the MNP.

“My child was very poor in food and after the introduction of the drug, he eats the food very well” said one of the women in the FGD. One man described that it is now that he is hearing his son saying he is hungry for the first time ever, which he attributed to the MNP.

The majority of the women attributed benefits to the MNP and could state why they gave it to their children. They were educated on the following key messages:

- MNP will make my child feel healthier
- MNP will make my child strong
- MNP will protect my child from disease
- MNP will prevent anaemia/shortage of blood

From the FGD the majority of the women could understand anaemia, causes and signs of anaemia. They could also describe foods that were rich in iron.



**Table 14: Level of activity of playfulness before and after taking MNP as reported by caregiver**

	% FSP children, as reported by caregivers (baseline)		% FSP children, as reported by caregivers (mid-point)		% FSP children, as reported by caregivers (end-point)	
	Kharaz (n=133)	Surrounding host community (n=45)	Kharaz (n=135)	Surrounding host community (n=45)	Kharaz (n=129)	Surrounding host community (n=45)
Very good	45.9% (61)	71.1% (32)	67.4% (91)	60.0% (27)	80.6% (104)	77.8% (35)
Good	54.1% (72)	20.0% (9)	30.4% (41)	40.0% (18)	17.1% (22)	22.2% (10)
Bad	0%	4.4% (2)	2.2% (3)	0%	2.3% (3)	0%
Very bad	0%	4.4% (2)	0%	0%	0%	0%

**Table 15: Appetite rating before and after taking MNP as reported by caregiver**

	% FSP children, as reported by caregivers		% FSP children, as reported by caregivers		% FSP children, as reported by caregivers	
	Kharaz (n=133)	Surrounding host community (n=45)	Kharaz (n=135)	Surrounding host community (n=45)	Kharaz (n=129)	Surrounding host community (n=45)
Very good	47.4% (63)	68.9% (31)	72.6% (98)	77.8% (35)	82.9% (107)	77.8% (35)
Good	46.6% (62)	28.9% (13)	23.7% (32)	22.2% (10)	14.7% (19)	22.2% (10)
Bad	6% (8)	2.2% (1)	3.0% (4)	0%	2.3% (3)	0%
Very bad	0%	0%	0.7% (1)	0%	0%	0%

### 3.3.4 COMPLIANCE

Consumption of MNP was checked after 15 days (mid-point HH visit) and after 27 days (end HH visit). The results are expressed according to the empty sachets counted. On the basis of these data collected over the one month test period, it was found that, on average, out of the 27 sachets distributed, children were given about 13 sachets at the mid point (the expected compliance was 14-15 sachets). Then, at the end point, the average number of sachets consumed was 11 and 14 sachets for kharaz and surrounding areas respectively (the expected compliance was 12-13 sachets). The surrounding areas had a higher number of mean number of sachets due to some data collection errors where one team added up all the sachets from the begging to the end point. The mean in this was 14 sachets per day but excluding those errors gave a mean sachet number of 12 as shown on the table above which was comparable to the refugee camp.

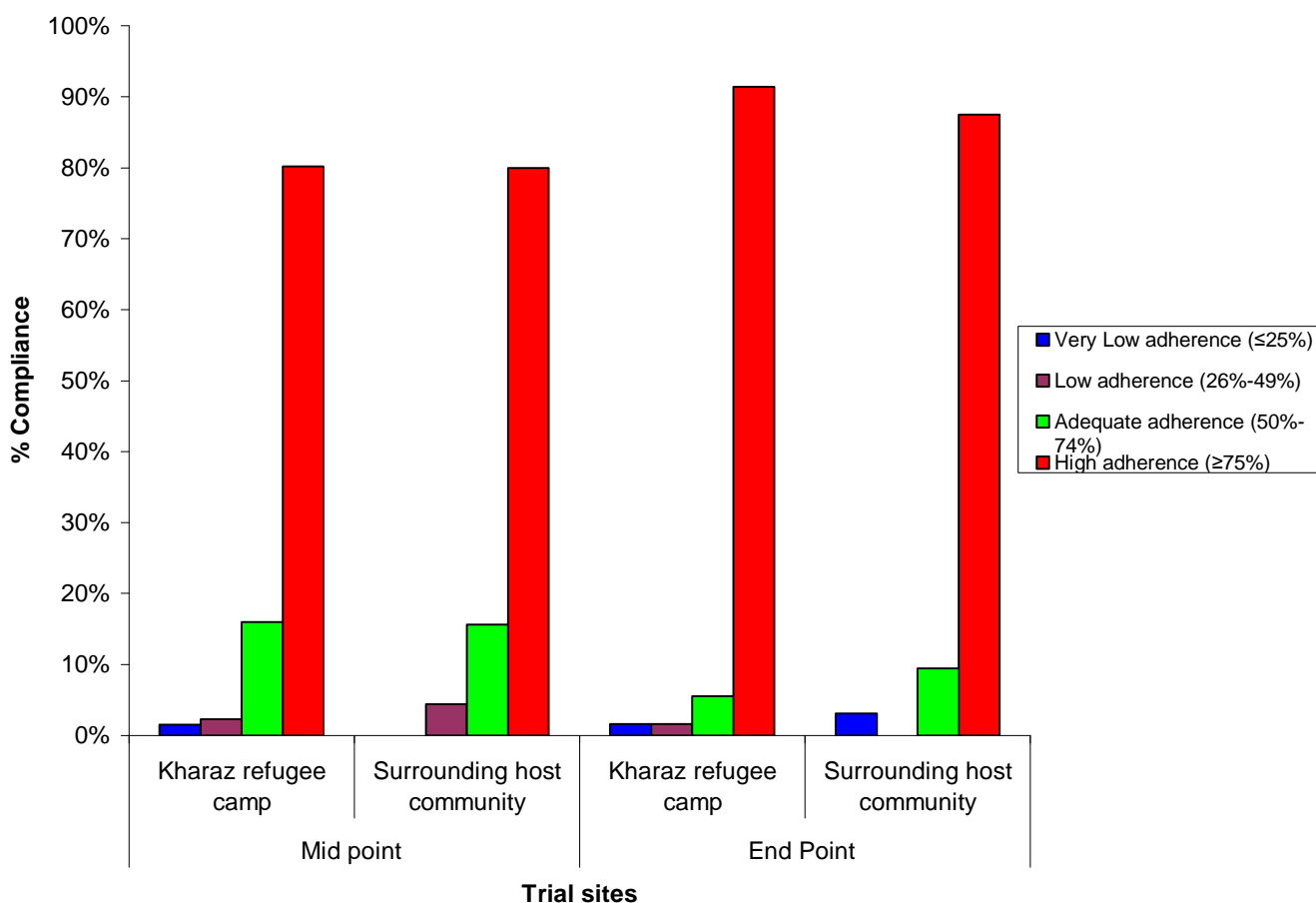
Therefore, the majority of the households consumed the expected number of sachets at the mid point and at the end point as shown in the table below except for the surrounding areas at the end point which was due to some data collection errors.

**Table 16: Average MNP sachet consumption**

	Mid-point		End point	
	Kharaz (n=135)	Surrounding host community (n=45)	Kharaz (n=129)	Surrounding host community (n=33)
Average number of consumed sachets	13	13	11	12
Consumed all 15 (after 15 days of the duration of the test)	77.8% (105)	82.2% (37)	80.6% (104)	53.7% (11)

NB: the days at the start was 14-15 days while at the end was 12-13 days.

**Figure 3: MNP compliance (based on the empty sachet count)**



**Table 17: Participants who lost or threw empty sachets**

	Mid-point		Mid-point	
	Kharaz n=135	Surrounding host community (n=45)	Kharaz (n=129)	Surrounding host community (n=41)
Participants that lost or threw empty sachets	9.6% (12)	2.2% (1)	7.8% (10)	4.9% (2)

Four women could not account for half of the sachets given. This was related to the

movement of the women to and from the camp and hence collected and left in some where else

**Table 18: MNP compliance (excluding participants that lost or threw empty sachets)**

	Mid point		End point	
	Kharaz refugee camp (n=133)	Surrounding host community (n=45)	Kharaz refugee camp (n=125)	Surrounding host community (n=32)
Very Low adherence ( $\leq 25\%$ )	1.5% (2)	0%	1.6% (2)	3.1% (1)
Low adherence (26%-49%)	2.3% (3)	4.4% (2)	1.6% (2)	.0%
Adequate adherence (50%-74%)	16.0% (21)	15.6% (7)	5.5% (7)	9.4% (3)
High adherence ( $\geq 75\%$ )	80.2% (105)	80.0% (36)	91.4% (117)	87.5% (28)

**Table 19: Participants that shared sachets**

	Mid-point		Mid-point	
	Kharaz refugee camp n=135	Surrounding host community (n=45)	Kharaz refugee camp n=131	Surrounding host community (n=42)
Participants that shared a sachet during the test	5.2% (7)	4.4% (2)	2.3% (3)	2.4% (1)

A few caregivers reported sharing the MNP with other household members during the household interview. This information was difficult to capture during the FGDs and KI interviews. Observations made by the data collectors indicated that the majority of women who reported sharing the MNP with other people in the household gave one or two sachets to one of the child's brother. They said that some children who were above the eligible age in the household felt jealous on why they were not given the MNP and the mother shared the MNP once in a while to please the child. The number of respondents who reported sharing was however very small. The majority of the women reported not sharing the MNP with anybody apart from the intended child. Continuous education and information on the MNP throughout the trial was also thought to have contributed to the reduction in sharing the MNP at the end point.

### 3.3.5 COMMUNITY'S PERCEPTIONS AND PREFERENCES

#### Perceptions of MNP

Both the refugees and the surrounding community population's approach towards acceptability of the MNP was very positive, and their willingness to the nutrition intervention to work was significant. There was no group that had contrary opinion towards the MNP.

In the refugee community, in most cases during the focus group discussions as well as during the KI interviews and the direct observations, most mothers were happy with the

product and explained the benefits of the product repeatedly. They explained the initial pre-trial sensitisation and practical demonstration of the product use were important. They explained the involvement of the local health workers in conducting the assessment was important and, because they trust the health care workers, this made them accept the product.

In the surrounding host community, where other qualitative assessments except direct observation was done, had similarly the caregivers showing liking for the product and explained the benefit they had experienced from the MNP use.

The stake holders in the camp, community elders and health staff showed willingness to accept the MNP positively. They explained that this new product will be helpful in improving the children's health and reduce anaemia in the camp. They suggested a lot of community education will be important in order to maintain compliance during implementation. They suggested the use of posters and microphones in the camp to educate the people on the MNP would be important before implementation.

It is important that community education during implementation should stress more on the sharing of the MNP and the possible side effect so that the product is not given to unintended group and not to stop the use due to expected side effects respectively. The need to explain to the care givers about the expected side effects of MNP will be important and encourage not to stop using the product if they see this effects..

#### Names Proposed for the Nutrition Product:

Although most of the caregivers or women could not recall the name of the MNP, they knew that MNP had a positive effect in reducing anaemia. The caregivers had problem using the term MNP and basically referred the MNP to drugs even after explaining to them that it was not a drug. The need to have a locally understandable name was therefore found important in order to avoid the use of the drug that had some negative reaction to some children.. The women could not come up with a name for the MNP however the KI interviews with the health staff and the camp elders suggested several names. The name Dheef which means "something that provide nutrients and micronutrients" came out mainly from the interviews. They suggested that the name could contribute to the child perceived thinking that the product was drugs and although the caregivers understood that the product was not a drug they did not have a preferred terms to use and basically used the word drug. And since the name "Dheef" was in Somali and the local host community KI and FGD could not be conducted, the name "Micronutrient" was translated in Arabic just to ensure that the local community can be able to read the product.

#### Package:

The package design of the MNP did not seem to be a matter of concern for any of the FGD participants. Concerning the MNP, 71.6% of the combined trial site groups said they felt some attraction to the package, however another 28.4% of respondents said they were not attracted to the package.

A number of women in FGDs and some KI mentioned some attraction to the main MNP box but not to the sachets. They suggested a colour change of the sachet with the smiling child clearly shown on the sachets. The colour green and orange came out clearly as preferred colours from the FGDs and the household questionnaires.

#### Dose frequency:

The dosing schedule of the MNP was chosen to be daily for the duration of the test. 91.4% of the combined trial site groups said they would prefer a daily dosage as opposed to other options of alternate days, once weekly and monthly. This was also reflected in FGDs and in the KI interviews. Respondents said they would abide to the strict instruction of the health workers. However a few respondents explained that there are likely to be situations when they will forget to give the MNP to the child and it would be hard to remember every day especially if it is on a long term period. Health care workers also echoed that it would be hard for families to remember the daily dose without the continued follow up that they had in the trial. In the post trial visit a scenario of strict, flexible and semi-strict regimen has been discussed. The strict regimen is a situation where caregivers are given 30 sachets and asked to provide one sachet per day per child while the flexible regimen is providing 15 sachets to be taken during the month with no more than one sachet a day.. During the trial period a third option of semi-strict regimen came up where caregivers are provided with 15 sachets and asked to finish in the first 15 days giving one sachet per child per day. For those who did not manage to give all in the first 15 days will then have the other 15 days to finish the MNP. The majority of the care givers preferred the semi-strict flexible regimen

### Barriers:

#### Community & family members

The caregivers and mothers were asked about acceptance or feeling aversion of the MNP by family members and general community members. 68.1% and 86.7% in the camp and in the surrounding areas respectively said the community would accept the product while 23.7% of the respondents in the camp said they were not sure.

Concerning family members, 94.8% and 97.8% of the MNP caregiver's said that the family members will accept the product. This similar feeling of non resistance was also observed in the focus group discussion and in the KI. They said the health of their children is important and nobody will object something that will improve the health of children.

In the refugee camp the women are the key people that are concerned with the health of the children and the father (men) play a minimal role in this. The women said that although the men are the key decision makers in the household, anything concerning the health of the children and household activities is their main concern and responsibility and men are not concerned. They reiterated that having a language that can be understandable to the community on the package will also enhance acceptability.

#### Rumours or superstition related to the nutrition products

Religious leaders do not have important roles in influencing on the eating habits of the community. Although the religious leaders are influential in other religious activities, they might not get involved in nutrition-related activities. It is noteworthy that traditional doctors and sorcerers are rare in the refugee camp.

There was no rumour reported throughout the duration of the test. However, some women mentioned that a few other block members who were not in the study were wondering why they were not included in the distribution which was a sign of feeling jealous but no rumour was reported.

To avoid the risk of superstition or rumours related of the MNP some of the women as well as the health staff recommended that the composition be written on the sachet and the packet labelled with a language the community can understand.

The Somali community is a highly oral society and messages can be passed from one person to the other by word of mouth. Although there are no rumours related to the MNP, a careful implementation of the intervention will be important. A one man misinformation can change completely the compliance and acceptability of the MNP. Involvement of key stake holders in the initial planning of intervention will be necessary so that there is not group that will sabotage the intervention. Inclusion of the grand council, health committees, local health staff are important in the intervention phase.

#### Storage of the product

Caregivers and women were sensitized on the importance of keeping the MNP in a dry and not hot place. The caregivers were careful in the storage of the product. Most of the household visits showed that the product was stored in a safe place and away from the direct sunlight. Many women hanged the product in a basket or paper bag on the wall of the sleeping house.

## 4.0 DISCUSSION

In general the MNP product was well accepted within the refugee camp as well as the surrounding host community. No objection to the product was shown by the community elders, health care staff and women and men in the camp and in the host community. The local population is very aware of the nutritional problems of the children in the areas. They have good knowledge on anaemia and are happy that products to improve this can be brought to their children.

A total of the 90.6% of respondents in both the refugee camp and the surrounding host community mentioned that they liked the MNP. Similarly a high proportion of respondents reported the ease of use of the MNP with an end point proportion of 97.7% and 100% for the refugee camp and the surrounding host community respectively. The majority of the respondents reported that MNP was added to rice (84.4%), pancakes (48.3%) and porridge (46.7%). In the FGD discussion most of the woman stated similar practices on the type of food to add to the MNP and said they mix the MNP with whatever is available in the household. The majority of the care givers also stated that they observed a yellowish colour upon addition of the MNP to the food. However no change in texture and taste was reported. Household observations also showed that 60.5 % of the households preferred to give the MNP during lunch while 36.6 % gave it at breakfast and a smaller percentage of 2.9% preferred to give it during dinner. The observation showed that the MNP was added to a small portion of the food in a separate plate for the child to eat.

Good appetite was mentioned as a positive effect for the children taking MNP. About 82.9% and 92.7% of the caregivers in the refugee camp and in the surrounding host community report very good appetite at the end of the trial interview. FGD participants and KI also mentioned the improved appetite and child's activity after the introduction of the MNP. The level of activity of the children on the MNP were reported as very good in 80.6 % and good in 17.1% of the children in the camp as the end of the trial. Similarly the ratings in the host community were 63.4% and 36.6% for very good and good respectively.

The majority of the respondents reported that that they observed a colour change in the stool with the change in stool colour reducing with the continued use of MNP and the incidence of reported stool colour was reduced by half. The majority of the responded described the colour of the stool as being brown (32.2%) and blackish (60.0%) for the combined trial sites. The side effects information given by the caregivers were not of major concern and the majority did not relate the side effects to the MNP except for the stool colour changes. Most of the women in the camp that had been in supplementation programme during their pregnancy understood that the dark stool was expected. Dark stools are very common side effect when taking iron and it is harmless.

Compliance was measured by counting the number of empty and full MNP sachets. Although this counting method is not the most reliable and partly relies on the reporting of caregivers, it was the most feasible to do in the context of this pilot project. When using this method, it is assumed that the entire MNP sachets were added to the food and fed to the child, and that the food was not shared with any other family members throughout the entire intervention. It is not uncommon that the caregiver shares the food to which MNP were added with other family members. The compliance results at the end of the trial were positive. High adherence to the MNP was seen in 91.4% and 87.5% of the participants in the refugee camp and in the surrounding areas respectively. At the end of the test, the reported sharing was low in both trial sites where about 2-3% of the caregivers reported sharing MNP at one point during the trial. A few care givers reported sharing the MNP with their elder children not in the trial was as a result of the older children feeling left out

and hence felt jealous. The routine household visits coupled with repeated practical demonstrations on how to add the MNP into food were found to be beneficial and helped in the compliance. A similar activity will also be important before the implementation of the MNP in the camp. Education sessions stressing on the mode of preparation, sharing and side effects will also be important before implementation. The preferred dosage of the MNP was a daily regimen however an alternative schedule of use was proposed for a long term programme. Despite the package not being mentioned as a major problem for the respondents, different sachet colours and local language information on the packet were suggested by the health care workers as well as the community leaders.

No rumour or superstition related to the MNP was mentioned during the acceptability test. The community and the families aim to improve the nutrition of their children and the perception of potential barriers were not anticipated. A total of the 68.1% and 86.7% in the camp and in the surrounding areas respectively said the community would accept the products while 23.7% of the respondents in the camp said they were not sure. Religious leaders do not seem to have an important role in the decision making of the community or household eating habits.

## **5.0 CONCLUSIONS**

The acceptability test results demonstrated that MNP are both acceptable to the refugees and to the community in the surrounding host community. The MNP were acceptable in terms of its ease to use, compliance, likeability and organoleptic properties (e.g. color and taste),



## 6.0 RECOMMENDATIONS

**Recommendations:** The findings presented in this report postulate that the MNP intervention can be implemented in Kharaz refugee camp as well as in the surrounding host community. Further in depth study with the local community perception will be important to be done in order to understand their perception on the MNP. Further recommendations are as follows:

### ***Recommended regimen:***

Although most of the caregivers preferred a daily use of the MNP sachets, there were concerns about forgetting to give the MNP on a daily basis as well lose some sachets in the household. The need to have a semi rigid regimen is therefore important in order to cater for those who are likely to forget giving the MNP on a daily basis and to cater for wastage of MNP sachets. A 15 days semi -strict regimen is suggested whereby caregivers can be instructed to provide a sachet a day during the first 15 days of each month leaving the rest of the month to finish the sachets for those who might have forgotten to provide a sachet a day in the first 15 days.

### ***Micronutrient formulation:***

The micronutrient formulation of MNP should avoid iodine, due to the fortification of salt with iodine and due to the origin of the population coming from Somalia having high iodine levels. In addition, iodine deficiency prevalence is low in Yemen. Annex shows the recommended formulation.

### ***Name and package design:***

A local name “Dheef” was suggested for the MNP which is a Somalia equivalent name for micronutrient and vitamins. The name “Micronutrient” has been translated to Arabic to cater for the Arab speaking population. There was no name suggestion for the MNP from the Arab community due to lack of focus group discussion .. The packaging design and colour is attached in the annex.

### ***Intervention roll-out:***

When the MNP is introduced there will be need to sensitize the community through the community elders, health committees and the ground council.

The Somali community is an oral society and although there were no rumours associated with the MNP, a slight misinformation can have adverse effects on the MNP intervention. There will be need for careful planning for the intervention and include all the stake holders from the beginning. The grand council, health committees, local health staff are very important to be involved in the implementation process.

A sensitisation campaign should be set up at least two weeks before the intervention. Frequent messages and sensitisation campaign will also be important to be done during the intervention. The sensitisation can be done through use of posters with the local language as well as public announcements using microphones. Special attention should be paid on how to use the MNP, what their benefits are, potential side effects and how to manage

them and information to avoid sharing. The existing community health workers need to be involved in the community mobilisation as well.

The distribution of the MNP should be done with the blanket distribution of WSB in the health facility. And in the event that the blanket distribution of WSB stops, the same staff should continue to distribute the MNP in the same way at the SFP department. A specific number of blocks should be served per day in order to avoid overcrowding and women going back without the MNP.

The distribution channel of the MNP to the host community should be carefully studied with at least one to two staff responsible for the distribution and monitoring of the MNP within the host community.

***Monitoring and evaluation:***

Each CHW should be responsible of monitoring the MNP use in his/her blocks of work. Similar staff should be involved in the monitoring of the local host communities. UNHCR newly developed Operational Guidance on the use of FSP in refugee setting should be followed to design the M&E component.

A nutrition and anaemia survey should be carried out in mid term intervention and end of the intervention in one year.(date to be determined).

## 6.0 ANNEXES

**Annex 1.** Recommended formulation for the Micronutrient Powders Programme to reduce anaemia in children aged 6-59 months in refugee operation, Yemen

Vitamin/Mineral	Population Reference Values							Assumed Dietary Intake <sup>3</sup>	WHO/WFP/UNICEF Joint Statement <sup>4</sup>	MNP formulation for Yemen Children aged 6-59 months		
	WHO/FAO RNI <sup>1</sup>				IOM UL <sup>2</sup>					6-59 months	Dose	Rationale
	0-6 months	7-12 months	1-3 years	4-6 years	0-12 months	1-3 years	4-8 years					
<b>Vitamin A</b> (µg RE)	375	400	400	450	600	600	900	591-646	400	<b>100</b>	The dose of vitamin A is lowered to 100 µg to ensure that the UL is not exceeded with intake from the GFD ration and other food sources <sup>11</sup> Bi-annual vitamin A supplementation is in place in the camp for children under-5 according to international guidelines.	
<b>Vitamin D</b> ( µg)	5	5	5	5	25	50	50	--	5	<b>5</b>	Joint Statement formulation <sup>11</sup> .	
<b>Vitamin E</b> (mg α-TE)	2.7	2.7	5.0	5.0	N/A	200	300	--	5	<b>5</b>	Joint Statement formulation <sup>11</sup> .	
<b>Vitamin C</b> (mg)	25	30	30	30	N/A	400	650	--	30	<b>30</b>	Joint Statement formulation.	
<b>Thiamine(Vitamin B<sub>1</sub>)</b> (mg)	0.2	0.3	0.5	0.6	N/A	N/A	N/A	--	0.5	<b>0.5</b>	Joint Statement formulation <sup>11</sup> .	
<b>Riboflavin (Vitamin B<sub>2</sub>)</b> (mg)	0.3	0.4	0.5	0.6	N/A	N/A	N/A	--	0.5	<b>0.5</b>	Joint Statement formulation <sup>11</sup> .	
<b>Niacin(Vitamin B<sub>3</sub>)</b> (mg NE)	2	4	6	8	N/A	10	15	--	6	<b>6</b>	Joint Statement formulation <sup>11</sup> .	
<b>Vitamin B<sub>6</sub></b> (mg)	0.1	0.3	0.5	0.6	N/A	30	40	--	0.5	<b>0.5</b>	Joint Statement formulation <sup>11</sup> .	
<b>Vitamin B<sub>12</sub></b> (µg)	0.4	0.7	0.9	1.2	N/A	N/A	N/A	--	0.9	<b>0.9</b>	Joint Statement formulation <sup>11</sup> .	
<b>Vitamin K</b> (µg)	5	10	15	20	N/A	N/A	N/A	--	--	<b>X</b>	Vegetables consumption is low in the camp. Vitamin K is essential for calcium metabolism, including blood clotting and bone formation.	
<b>Folic Acid</b> (µg DFE)	80	80	150	200	N/A	300	400	--	150	<b>0</b>	Artesunate plus SP (fansidar) is used for malaria treatment. It is currently recommended not to provide supplemental folic acid to young children where antifolate antimalaria drugs are used <sup>12</sup> Wheat flour and CSB distributed in the camp contain folic acid.	

<b>Iron<sup>a</sup> (mg)</b>	None <sup>b</sup>	6.2 <sup>5</sup> 9.3 <sup>6</sup> 18.6 <sup>7</sup>	3.9 <sup>5</sup> 5.8 <sup>6</sup> 11.6 <sup>7</sup>	4.2 <sup>5</sup> 6.3 <sup>6</sup> 12.6 <sup>7</sup>	40	40	40	14.2-16.5	10	<b>10</b>	Joint Statement formulation <sup>11</sup> Malaria not prevalent, reduced transmission observed and improved treatment and detection. Net distribution and spraying in place. RDT available for on the spot diagnosis.	
<b>Zinc (mg)</b>		1.1 <sup>8,c</sup> 2.8 <sup>9</sup> 6.6 <sup>10</sup>	0.8 <sup>8,c</sup> 4.1 <sup>9</sup> 8.4 <sup>10</sup>	2.4 <sup>8</sup> 4.1 <sup>9</sup> 8.3 <sup>10</sup>	2.9 <sup>8</sup> 4.8 <sup>9</sup> 9.6 <sup>10</sup>	4-5	7	12	--	4.1	<b>4.1</b>	Joint Statement formulation <sup>11</sup> .
<b>Copper (mg)</b>	N/A	N/A	N/A	N/A	N/A	1	3	--	--	0.56	<b>0.34</b>	Dosage below the Joint Statement formulation to ensure it is well below the UL for children aged 1-3 years <sup>11</sup> .
<b>Selenium (µg)</b>	6	10	17	22	45-60	90	150	--	--	17	<b>17</b>	Joint Statement formulation <sup>11</sup> .
<b>Iodine(µg)</b>	90	90	90	90	N/A	200	300	121-181	--	90	<b>0</b>	Iodine excess is present in Somalia <sup>13</sup> , country of origin for most refugees in the camp. GFD contains iodine. Low prevalence of iodine deficiency in Yemen <sup>14</sup> . No additional iodine sources should be given.

DFE: Dietary Folate Equivalent; FAO: Food and Agriculture Organisation; GFD: General Food Distribution; IOM: Institute of Medicine; N/A: Not Available; NE: Niacin Equivalent; RE: Retinol Equivalent; RNI: Recommended Nutrient Intakes; UL: Upper limit; WHO: World Health Organisation.

<sup>1</sup> Joint FAO/WHO Expert Consultation. (2002) Vitamin and mineral requirements in human nutrition. World Health Organization, Geneva, Switzerland.

<sup>2</sup> Institute of Medicine (IOM), Dietary Reference Intakes. National Academy Press, Washington D.C., USA.

<sup>3</sup> These values are *rough* estimates and are based on assumptions specified in appendices 1-2. The ranges of intake values were selected as the highest and lowest of all estimated values (for children <2 and 2-5 years).

<sup>4</sup> Joint Statement by WHO/WFP/UNICEF. (2006) Preventing and controlling micronutrient deficiencies in populations affected by an emergency. Multiple vitamin and mineral supplements for pregnant and lactating women and for children aged 6 to 59 months.

<sup>5</sup> Assuming 15% bioavailability.

<sup>6</sup> Assuming 10% bioavailability.

<sup>7</sup> Assuming 5% bioavailability.

<sup>8</sup> Assuming high bioavailability (50%).

<sup>9</sup> Assuming moderate bioavailability (30%).

<sup>10</sup> Assuming low bioavailability (15%).

<sup>11</sup> Dosage also used in MNP programmes in Algeria, Nepal and Bangladesh refugee operations.

<sup>12</sup> WHO Secretariat on behalf of the participants to the Consultation. Conclusions and recommendations of the WHO Consultation on prevention and control of iron deficiency in infants and young children in malaria-endemic areas. (2007) Food Nutr Bull vol. 28, no. 4 S621-631

<sup>13</sup> National Micronutrient and Anthropometric Nutrition Survey, Somalia 2009' (2010) <http://www.fsnau.org/products/research-studies>

<sup>14</sup> Zein AZ, Al-Haithamy S, Obadi Q, Nouredin S. The epidemiology of iodine deficiency disorders (IDD) in Yemen. Public Health Nutrition:3(2), 245-252

<sup>a</sup> Bioavailability of dietary iron during this period varies greatly.

<sup>b</sup> Neonatal iron stores are sufficient to meet the iron requirement for the first 6 months in full-term infants. Premature infants and low birth weight infants require additional iron. Breastfed.

## Annex 2 : Data Collection tools

### Form 1. Eligibility of Child Questionnaire

Is the child aged 6 to 59 months based on EPI cards	Yes .....1 No.....2	If any of the answers in the first 5 questions is <b>NO</b> , do not enrol the child
Is the child eating at least one complementary food a day in addition to breast milk?	Yes .....1 No.....2	
Is the child having signs of malnutrition or oedema	Yes .....1 No.....2	
Will the child be available for the one month during the period of the trail.	Yes .....1 No.....2	
Does the mother or Care taker give a verbal consent on behalf of the child?	Yes .....1 No.....2	

**Kindly continue with the Questionnaire if all the above questions are circled Yes and enrol the child. Do not enrol the child if any of the questions above is NO**

EQ1. Date of Visit (dd/mm/yyyy)		
EQ2. Name of data collector		
EQ.3 Status of the Household	Refugee.....1 Local community.....2	
EQ.4. Block Number/ Village name		
EQ5. Household Number		
EQ6. Household Code (B13-07) or Huweri A-01		
EQ7 Child's Name		
EQ9. Child Trial Number ( Block/ HouseNo/ Child number ( B13-07-01) or H01-01-01		
EQ10. Child's sex:.	Male.....1 Female .....2	
EQ11. Date of birth of the child (dd/mm/yyyy)		
EQ12. Was the child's health card seen?	Yes .....1 No.....2	
EQ13. Age of Child (in Months)	_____ Months	
EQ14. Is the child well? (check physically)		
EQ15. If child is not well why not?		
EQ16. Oedema?	Yes .....1 No.....2	
EQ17.Do you still breastfeed the child?	Yes .....1 No.....2	
EQ18.Do you give your child semi solid or solids foods	Yes .....1 No.....2	
EQ19.If yes how many times a day ?	One time .....1 Two times .....2 Three times .....3 More than three times .....4	
EQ20. From what age has the child been given complementary food (semi solids or solid foods)	Four months .....1 5 months .....2 6 months .....3 7 months .....4 8 months .....5 9 and above.....6 Don't know .....9	

EQ21. What type of complementary do you give your child?	Mashed Potato .....1 Mashed rice or spagetti.....2 Porridge .....3 Mashed Anjero.....4 Mashed Qubs or chapati.....5 Other (specify) .....6	
EQ22. Number of people living in the Household		
EQ23. Number of people living in the household less than 5 years		
EQ24. Names of head of household		
EQ25. Name of mother		
EQ26. Relationship of the mother to the child	Mother .....1 Other..... .2	
EQ27. Age of the mother in Years	Yrs	
EQ28. Marital status	Never Married .....1 Married.....2 Divorce.....3 Separated .....4 Widowed .....5	
EQ29. Has the mother ever attended school?	Yes..... 1 No .....2	
EQ30. If yes what level	Koranic..... 1 Primary .....2 Secondary.....3 university/college .....4 other Specify.....5	
EQ31. Which language are you able to read?	Arabic .....1 Somali.....2 English .....3 Other (specify) .....4	
EQ32. Explained the MNP acceptability trial?	Yes .....1 No..... ....2	
EQ33. Was the mother interested in the study	Yes .....1 Probably..... 2 No .....3 Don't Know.....4	
EQ34 Number of MNP sachet given?		

**FORM 2. BASELINE HOUSEHOLD INTERVIEW**

**Acceptability test of the MNP for children ages 6-59 months**

**UNHCR**

After explaining to the mother or caretaker the aim of the acceptability test, and she has agreed to participate in the trial do a demonstration of how to use the product. At the end do the questionnaire.

Date of monitoring visit (dd/mm/yyyy)		
Name of Interviewer		
Status of the Household	Refugee.....1 Local community.....2	
Block Number/ Village name		
Household Number		
Household Code		
BL1. Child's Name		
BL2 Child Identification Number		
BL3 Is the mother or primary caregiver of the child present?	Yes.....1 No.....2	If 2 return back later
BL4. Relationship of respondent to the child	Mother.....1 Other (specify).....2	
BL5. Respondent's Name		
<b>FIRST PERCEPTION:</b>	<b>QUESTION</b>	<b>ANSWER</b>
BC1	Did you notice a change in colour when MNP was added to food?	Yes.....1 No.....2 I am not sure.....3
		If 2 skip BC3
BC2	If colour change, what colour did it change to ?	Yellow.....1 Brown .....2 Red .....3 White .....4 Don't Know.....5
BC3	Did the food change taste when MNP was added?	
BC4	If taste changed, what was the taste ?	Sour .....1 Sweet.....2 Don't know .....9
	Does MNP remind you of something you already know?	Yes.....1 No.....2 I am not sure.....3
		2⇒ BC4
	If BC5 is Yes then what is it? Please describe.	
	In relation to the instructions of how to use MNP –Are they easy to follow?	Yes.....1 No.....2
	Do you think the other household members will be able to follow the instructions of how to use the MNP for the young child?	Yes.....1 No.....2 I am not sure.....3



	What do you think about the packaging. Do you feel attraction for it?	Yes.....1 No.....2 I am not sure.....3	
	Do you feel dislike for the package?	Yes.....1 No.....2 I am not sure.....3	
	Would you prefer a different color of packaging?	Yes.....1 No.....2 I am not sure.....3	2, 3⇒ BC10
	If you prefer a different colour, which colour should it be?	Yellow.....1 Green.....2 Blue .....3 Red.....4 Black.....5 Others -Specify.....6	
	Do you think the label should be different?	Yes.....1 No.....2 I am not sure.....3	2,3⇒ BC12
BC14	If BC13 is Yes, please describe what the label should be like.		

DOSE FREQUENCY	QUESTION	ANSWER	
	Would it be difficult to give one dose a day of MNP mixed with food to your child?	Yes.....1 No.....2 I am not sure.....3	
	How often would you prefer to give the MNP to your child?	Once daily.....1 Every two days .....2 Occasionally.....3 Once a week .....4 Other (specify).....5	

FEEDING HABITS	QUESTION	ANSWER	
BF1	How do you organize the meals in the family?	Whole family eats in the same dish .....1 Men, women and children separated .....2 Adults and children eat separately.....3	
BF2	Would you be willing to give to your child his/her own bowl to mix the MNP with the food?	Yes.....1 No.....2 I am not sure.....3	
BF3	Do you already have a dish at home to be used for that?	Yes.....1 No.....2	
BF4	Do you think that children from 6 to 59 months of age at home would eat their food if the food is mixed with MNP?	Yes.....1 No.....2 I am not sure.....3	
BARRIERS	QUESTION	ANSWER	

BB1	What will your family members think if you bring the MNP at home to give it to your young children?	Will accept .....1 Will reject.....2 I am not sure.....3	1⇨ BB3
BB2	What family member would show more dislike?	Grandmothers .....1 Men of the house .....2 Other (specify .....3 _____	
BB3	Do you think the rest of the community where you live will accept that their children take MNP?	Yes.....1 No.....2 I am not sure.....3	
BB4	Do you think that there might be a rumor or superstition about MNP in your community?	Yes.....1 No.....2 I am not sure.....3	2,3 ⇨ BR1
BB5	If BB4 is yes then what is the rumour? Please specify		

5.Child activity and appetite	QUESTION	ANSWER	CODE
BR1	How do you classify your child's appetite	Very good .....1 Good.....2 Bad .....3 Very bad .....4	
BR2	How do you classify your child's level of activity or playfulness	very good .....1 good.....2 bad .....3 very bad .....4	

END OF THE FIRST SURVEY OF THE HOUSEHOLD. PLEASE, THANK THE MOTHER OR CARETAKER AND REMIND HER THAT THE CHILD SHOULD TAKE MNP DAILY FOR 4 WEEKS AND YOU WILL RETURN TO VISIT THE HOUSEHOLD IN TWO WEEKS

**FORM 3. SECOND HOUSEHOLD INTERVIEW**

**Acceptability test of the MNP for children ages 6-59 months**

**UNHCR**

Date of monitoring visit (dd/mm/yyyy)		
Name of Interviewer		
Status of the Household	Refugee.....1 Local community.....2	
Block Number/ Village name		
Household Number		
Household Code (Block/HHNo) B13-01 or HA-01		
B2L1. Child's Name		
B2L2 Child Identification Number ( B13-01-01 or HA-01-01)		
B2L3 Is the mother or primary caregiver of the child present?	Yes.....1 No.....2	If 2 return back later
B2L4. Relationship of respondent to the child	Mother.....1 Other (specify).....2	

**COMPLIANCE**

Q-No	QUESTION	Code ANSWER	Remarks
B2C1	Number of empty sachets:	No _____	Collect all empty sachets
B2C2	Number of full sachets:	No _____	
B2C3	Have you lost or thrown an empty sachet of MNP during the last 15 days?	Yes.....1 No.....2 I am not sure.....3	2,3 → B2C5
B2C4	Have you given MNP to children or persons other than your young child who was included in the study?	Yes.....1 No.....2	
B2C5	How often did you give MNP to your child in the last 15 days? <i>Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned</i>	Every day .....1 Several times a day .....2 Every other day .....3 Twice a week.....4 Once a week.....5  Other (specify).....9	

B2C6	The last time you used MNP, how did you give it to your child?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Added to family pot of food.....1 The child ate the MNP with a small quantity of food and then continued to eat with the rest of the family in the common plate.....2 Added to all the children food.....3 Added to individual cup or plate for child..4 Added to drink.....5  Other (Specify).....6	
B2C7	Why did you prepare it like that (refer to previous response)?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Easier to prepare.....1 My child likes it more this way.....2 Child does not want to eat alone.....3 Child suspicious of eating alone.....4 This is the instructions given to us.....5 Child refuse food .....6  Other (specify).....6	
B2C8	Did your child drink tea before or after consuming the meal with MNP?	Yes.....1 No.....2 Don't know .....3	
B2C9	Did you add the MNP into the food while the child was seeing?	Yes.....1 No.....2	2, → B2D1
B2C10	How did the child react to the food added to the MNP	very good .....1 good.....2 bad .....3 very bad .....4	
B2C11	Where do you store your child's MNP?  Observe and circle those answers that apply	Somewhere in the house out of sunlight....1 Somewhere in the home away from heat source.....2 In the kitchen.....3 Outside.....4  Other (specify).....4	

### ACCEPTABILITY

Q-No	QUESTION	Code ANSWER	Remarks
B2D1	Do you think that MNP is easy to use?	Yes.....1 No.....2 I am not sure.....3	1 → .B2D 3..
B2D2	If no, why?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Not received enough information about how to use it .....1 Nobody at home can read information written on the sachet..2 The images on the sachet are confusing.....3. There is too much information to read.....4 The written information is not in my language .....5 It was difficult to have a separate plate for the child ....6 Dont Know.....7  Others Specify).....8	

B2D3	Did you ever have problem with MNP use?	Yes.....1 No.....2	2 → B2D5 ...
B2D4	If yes, which problems did you have? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Could not open sachet.....1 Could not understand usage instructions....2 Was difficult to separate the children food...3  Other (Specify).....4	
B2D5	Does your child like the MNP	Yes.....1 No.....2 I am not sure.....3	
B2D6	Do you notice a change in the level of appetite of your child since s/he started taking MNP?	Yes.....1 No.....2 I am not sure.....3	
B2D7	How do you classify your child's appetite	very good .....1 good.....2 bad .....3 very bad .....4	
B2D8	Do you notice a change in the level of activity and playfulness of your child since s/he started taking MNP?	Yes.....1 No.....2 I am not sure.....3	
B2D9	How would you categorize the level of activity or playfulness of your child	very good .....1 good.....2 bad .....3 very bad .....4	
B2D10	How often did your child finish the whole food mixed with MNP you offered him / her	Every time .....1 Almost every time .....2 Sometimes .....3 Never.....4	
B2D11	Do you have some doubt about how to add MNP to your child's food?	Yes.....1 No.....2	
B2D12	Is there some reason that you would like to stop using MNP?	Yes.....1 No.....2	2→ SE1
B2D13	Why would you like to stop using MNP? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	I don't like the flavour or aspect of the aliments when MNP is added.....1 MNP don't have positive effects.....2 MNP have negative secondary effects.....3 MNP is bad for health .....4 A neighbour/ friend/ familiar/ religious leader / community leader told me to not take it .....5 It's difficult to remember to take MNP.....6 The package is difficult to open .....7 I don't like the logo or the packing .....8 Don't know.....9 Other aspects (specify) .....10	

**FOOD TYPE USED  
AND EFFECT ON FOOD**

Q-No	QUESTION	Code ANSWER	Remarks
F2T1	Has the MNP caused any change in your child's food when added?	Yes.....1 No.....2	2→...
F2T2	If yes, which aspect of the food have been affected?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned</i>	Color.....1 Texture .....2 Smell.....3 Taste .....4  Other aspect (specify).....5	
F2T3	With which foods do you like to mix the MNP with for your child?  <i>Read responses and record answers</i>	Y    N Rice.....1.....2 Spaghetti.....1.....2 Anjero (loxo).....1.....2 Porridge.....1.....2 Lentils .....1.....2 Beans (fuul).....1.....2  Others (Specify).....1.....2	

SIDE EFFECTS			
	QUESTION	Code ANSWER	
S2E1	Has this child had diarrhoea over the past 15 days? ( <i>Diarrhoea is more than 3 loose stools in a day</i> )	Yes.....1 No.....2	
S2E2	Did the child stool colour change over the past 15 days?	Yes.....1 No.....2	2 → SE4
S2E3	If yes, what color was the stool?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Brown.....1 Blackish.....2 Red.....3 Dont know.....4 Others (Specify).....5  _____	
S2E4	Have the child had constipation over the past 15 days?	Yes.....1 No.....2	
S2E5	Did child experience vomiting over the past 15 days?	Yes.....1 No.....2	
S2E6	Did child experience nausea over the past 15 days?	Yes.....1 No.....2	
S2E7	Have the child had abdominal pain over the past 15 days?	Yes.....1 No.....2	
S2E8	Have the child had any other health problem over the past 15 days?	Yes.....1 No.....2	
S2E9	If yes to any question between SE4 and SE8: do you think that these health problems are due to the MNP?	Yes.....1 No.....2 I am not sure.....3	
S2E10	If yes to any question between SE4 and SE8: did you stop giving the MNP to your child or would you like to stop giving the MNP to your child?	Yes.....1 No.....2	
S2E11	In case you have filed a medical problem described above, have you stopped giving the child the MNP?	Yes.....1 No.....2	

KNOWLEDGE	QUESTION	Code ANSWER	
K2M1	According to you, please tell me what is MNP? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Vitamins/minerals for children.....1 Supplement.....2 Medicine.....3  Other (specify).....4	

K2M2	Do you know the reasons why you should give MNP to your child?	Yes.....1 No.....2 I am not sure.....3	2,3→ ...
K2M3	If yes, what are the reasons why you give MNP to your child? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	MNP will make my child feel healthier.....1 MNP will make my child strong.....2 MNP will make my child fat.....3 MNP will protect my child from disease.....4 MNP will prevent anaemia/shortage of blood.....5 MNP will improve my child's growth.....6 Others (specify).....7	
K2M4	How often should MNP be consumed? <i>Is this the correct frequency, as specified at the beginning of the test</i>	Daily .....1 Every alternate days.....2 Weakly.....3 Monthly.....4 Others (specify).....5	
K2M5	What quantity of MNP should be consumed each time? <i>Is this the correct frequency, as specified at the beginning of the test</i>	Half sachet daily.....1 One sachet.....2 Two sachets .....3 More than two .....4	
K2M6	Have you ever heard of anaemia or shortage of blood?	Yes.....1 No.....2 I am not sure.....3	
K2M7	How can you tell if your child has shortage of blood? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	.Y N Pale skin, eyes, the inner mouth, and nails .... 1 2 Lack of energy, tiredness and weakness.....1 2 Nails become thin, and break off easily.....1 2 Tongue becomes sore, shiny and reddened.....1 2 Hair thins out and breaks off easily.....1 2 Shortness of breath and rapid heart bits .....1 2 Desire to eat non food items like soil, charcoal..1 2 Decreased appetite .....1 2 Disturbed sleep .....1 2 Don't know.....1.....2 Other (Specify).....1.....2	
K2M8	What do you think cause anaemia or shortage of blood in children? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	....Y N Malaria .....1 2 Worms .....1 2 Lack of diet rich in iron like meat and liver....1 2 Not breastfeeding .....1 2 Don't know .....1 2 Other (Specify).....1.....2	



K2M9	What are some ways to prevent anaemia or shortage of blood in your child?	<p style="text-align: right;">.....Y</p> <p>N</p> <p>Treating Malaria .....1 2</p> <p>Deworming .....1 2</p> <p>Improving diet to include iron rich foods.....1 2</p> <p>Exclusive breastfeeding for the first 6 months 1 2</p> <p>Avoiding diseases and infections .....1 2</p> <p>Don't know .....1 2</p> <p>Other (Specify).....1.....2</p>	
K2M10	Have you ever heard of mineral iron?	<p>Yes.....1</p> <p>No.....2</p>	
K2M11	Do you know food that contain mineral iron?	<p>Yes.....1</p> <p>No.....2</p>	
K2M12	If yes which food are rich in Iron?	<p style="text-align: right;">Y.....N</p> <p>Meat, fish and chicken.....1.....2</p> <p>Eggs .....1.....2</p> <p>Dark green leafy vegetables .....1.....2</p> <p>Beans and peas.....1.....2</p> <p>Fortified flour (CSB).....1.....2</p> <p>Breast milk.....1.....2</p> <p>Don't know .....1.....2</p> <p>Others (specify).....1.....2</p>	

Question code	Please provide any other comments about MNP and the interview:
---------------	--

END OF THE SECOND SURVEY OF THE HOUSEHOLD. PLEASE, THANK THE MOTHER OR CARETAKER AND REMIND HER THAT THE CHILD SHOULD TAKE MNP DAILY FOR 2 MORE WEEKS AND YOU WILL RETURN TO VISIT THE HOUSEHOLD IN TWO WEEKS

NB :Please inform the caregiver or the mother that the side effects mentioned in S2E4 to S2E8 may not be due to the MNP. However, there is a possibility that they may be due to the MNP. Changes in stool colour, loose stool constipation and abdominal discomfort can happen especially if they are not used to iron and vitamin C supplements. These side effects should diminish with time, are rarely reported and are not harmful to health.

## Acceptability test of the MNP for children ages 6-59 months

UNHCR

Date of monitoring visit (dd/mm/yyyy)		
Name of Interviewer		
Status of the Household	Refugee.....1 Local community.....2	
Block Number/ Village name		
Household Number		
Household Code (Block/HHNo) B13-01 or HA-01		
B3L1. Child's Name		
B3L2 Child Identification Number ( B13-01-01 or HA-01-01)		
B3L3 Is the mother or primary caregiver of the child present?	Yes.....1 No.....2	If 2 return back later
B3L4. Relationship of respondent to the child	Mother.....1 Other (specify).....2	

## COMPLIANCE

Q-No	QUESTION	Code ANSWER	Remarks
B3C1	Number of empty sachets:	No _____	Collect all empty sachets
B3C2	Number of full sachets:	No _____	
B3C3	Have you lost or thrown an empty sachet of MNP during the last 15 days?	Yes.....1 No.....2 I am not sure.....3	
B3C4	Have you given MNP to children or persons other than your young child who was included in the study?	Yes.....1 No.....2	Emphasize not to share at end
B3C5	How often did you give MNP to your child in the last 15 days? <i>Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned</i>	Every day .....1 Several times a day .....2 Every other day .....3 Twice a week.....4 Once a week.....5  Other (specify).....9	Correct any misuse at end
B3C6	The last time you used MNP, how did you give it to your child? <i>Note: Do not probe; circle only those answers that are mentioned. Circle</i>	Added to family pot of food.....1 The child ate the MNP with a small quantity of food and then continued to eat with the rest of the family in the common plate.....2	Correct any misuse at end

	<i>ALL responses mentioned</i>	Added to all the children food.....3 Added to individual cup or plate for child..4 Added to drink.....5  Other (Specify).....6	
B3C7	Why did you prepare it like that (refer to previous response)?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Easier to prepare.....1 My child likes it more this way.....2 Child does not want to eat alone.....3 Child suspicious of eating alone.....4 This is the instructions given to us.....5 Child refuse food .....6  Other (specify).....6	Correct any mis-understanding at end
B3C8	Did your child drink tea before or after consuming the meal with MNP?	Yes.....1 No.....2 Don't know .....3	Emphasize no tea before or after at end
B3C9	Did you add the MNP into the food while the child was looking?	Yes.....1 No.....2	2, → B3C11
B3C10	How did the child react to the food added to the MNP  Read responses	very good .....1 good.....2 bad .....3 very bad .....4	
B3C11	Where do you store your child's MNP?  Observe and circle those answers that apply (MNP should be stored in a cool, dry, clean place within the home.)	Somewhere in the house out of sunlight....1 Somewhere in the home away from heat source.....2 In the kitchen.....3 Outside.....4  Other (specify).....4	Correct any mis-understanding at end

### ACCEPTABILITY

Q-No	QUESTION	Code ANSWER	Remarks
B3D1	Do you think that MNP is easy to use?	Yes.....1 No.....2 I am not sure.....3	1 → B3D3.
B3D2	If no, why?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Not received enough information about how to use it .....1 Nobody at home can read information written on the sachet..2 The images on the sachet are confusing.....3. There is too much information to read.....4 The written information is not in my language .....5 It was difficult to have a separate plate for the child ....6 Dont Know.....7  Others Specify).....8	Clarify and educate at end
B3D3	Did you ever have problem with MNP use?	Yes.....1 No.....2	2 → B3D5 ...
B3D4	If yes, which problems did you have? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Could not open sachet.....1 Could not understand usage instructions....2 Was difficult to separate the children food...3	Clarify and educate at end

		Other (Specify).....4	
B3D5	Do you think your child likes MNP	Yes.....1 No.....2 I am not sure.....3	
B3D6	Do you notice a change in the level of appetite of your child since s/he started taking MNP?	Yes.....1 No.....2 I am not sure.....3	
B3D7	How do you classify your child's appetite Read responses	very good .....1 good.....2 bad .....3 very bad .....4	
B3D8	Do you notice a change in the level of activity and playfulness of your child since s/he started taking MNP?	Yes.....1 No.....2 I am not sure.....3	
B3D9	How would you categorize the level of activity or playfulness of your child Read responses	very good .....1 good.....2 bad .....3 very bad .....4	
B3D10	How often did your child finish the whole food mixed with MNP you offered him / her Read responses	Every time .....1 Almost every time .....2 Sometimes .....3 Never.....4	
B3D11	Do you have some doubt about how to add MNP to your child's food?	Yes.....1 No.....2	Clarify and educate at end
B3D12	Is there some reason that you would like to stop using MNP?	Yes.....1 No.....2	2→ F3T1
B3D13	Why would you like to stop using MNP? Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned	I don't like the flavour or aspect of the aliments when MNP is added.....1 MNP don't have positive effects.....2 MNP have negative secondary effects.....3 MNP is bad for health .....4 A neighbour/ friend/ familiar/ religious leader / community leader told me to not take it .....5 It's difficult to remember to take MNP.....6 The package is difficult to open .....7 I don't like the logo or the packing .....8 Don't know.....9 Other aspects (specify) .....10	Clarify and educate at end

FOOD TYPE USED AND EFFECT ON FOOD			
Q-No	QUESTION	Code ANSWER	Remarks
F3T1	Has the MNP caused any change in your child's food when	Yes.....1 No.....2	2→F3T3

	added?		
F3T2	If yes, which aspect(s) of the food have been affected?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned</i>	Color.....1 Texture .....2 Smell.....3 Taste .....4  Other aspect (specify).....5	
F3T3	With which foods do you like to mix the MNP with for your child?  <i>Read responses and record answers</i>	<p style="text-align: center;">Y      N</p> Rice.....1.....2 Spaghetti.....1.....2 Anjero (loxox).....1.....2 Porridge.....1.....2 Lentils .....1.....2 Beans (fuul).....1.....2  Others (Specify).....1.....2	

**SIDE EFFECTS**

	QUESTION	Code ANSWER	
S3E1	Has this child had diarrhoea over the past 15 days? ( <i>Diarrhoea is more than 3 loose stools in a day</i> )	Yes.....1 No.....2	
S3E2	Did the child stool colour change over the past 15 days?	Yes.....1 No.....2	2 → SE4
S3E3	If yes, what color was the stool?  <i>Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned</i>	Brown.....1 Blackish.....2 Red.....3 Dont know.....4 Others (Specify).....5  _____	
S3E4	Have the child had constipation over the past 15 days?	Yes.....1 No.....2	
S3E5	Did child experience vomiting over the past 15 days?	Yes.....1 No.....2	
S3E6	Did child experience nausea over the past 15 days?	Yes.....1 No.....2	
S3E7	Have the child had abdominal pain over the past 15 days?	Yes.....1 No.....2	
S3E8	Have the child had any other health problem over the past 15 days?	Yes.....1 No.....2	
S3E9	If yes to any question between SE4 and SE8: do you think that these health problems are due to the	Yes.....1 No.....2 I am not sure.....3	Reassure mother

	MNP?		
S3E10	If yes to any question between SE4 and SE8: did you stop giving the MNP to your child or would you like to stop giving the MNP to your child?	Yes.....1 No.....2	Clarify and educate
S3E11	In case you have filed a medical problem described above, have you stopped giving the child the MNP?	Yes.....1 No.....2	Follow-up needed by coor-dinator

KNOWLEDGE	QUESTION	Code ANSWER																															
K3M1	According to you, please tell me what is MNP? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	Vitamins/minerals for children.....1 Supplement.....2 Medicine.....3 Other (specify).....4																															
K3M2	Do you know the reasons why you should give MNP to your child?	Yes.....1 No.....2 I am not sure.....3	2,3→K3M4 Clarify and educate																														
K3M3	If yes, what are the reasons why you give MNP to your child? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	MNP will make my child feel healthier.....1 MNP will make my child strong.....2 MNP will make my child fat.....3 MNP will protect my child from disease.....4 MNP will prevent anaemia/shortage of blood.....5 MNP will improve my child's growth.....6 Others (specify).....7	Clarify and educate																														
K3M4	How often should MNP be consumed? <i>Is this the correct frequency, as specified at the beginning of the test</i>	Daily .....1 Every alternate days.....2 Once weekly.....3 Once monthly.....4 Others (specify).....5	Correct any misuse																														
K3M5	What quantity of MNP should be consumed each time? <i>Is this the correct frequency, as specified at the beginning of the test</i>	Half sachet daily.....1 One sachet.....2 Two sachets .....3 More than two .....4	Correct any misuse																														
K3M6	Have you ever heard of anaemia or shortage of blood?	Yes.....1 No.....2 I am not sure.....3																															
K3M7	How can you tell if your child has shortage of blood? <i>Note: Do not probe; circle only those answers that are mentioned. Circle ALL responses mentioned</i>	<table style="width:100%; border:none;"> <tr> <td></td> <td style="text-align:right">.Y</td> <td style="text-align:right">N</td> </tr> <tr> <td>Pale skin, eyes, the inner mouth, and nails</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Lack of energy, tiredness and weakness</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Nails become thin, and break off easily</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Tongue becomes sore, shiny and reddened</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Hair thins out and breaks off easily</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Shortness of breath and rapid heart bits</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Desire to eat non food items like soil, charcoal</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Decreased appetite</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> <tr> <td>Disturbed sleep</td> <td style="text-align:right">.....1</td> <td style="text-align:right">2</td> </tr> </table>		.Y	N	Pale skin, eyes, the inner mouth, and nails	.....1	2	Lack of energy, tiredness and weakness	.....1	2	Nails become thin, and break off easily	.....1	2	Tongue becomes sore, shiny and reddened	.....1	2	Hair thins out and breaks off easily	.....1	2	Shortness of breath and rapid heart bits	.....1	2	Desire to eat non food items like soil, charcoal	.....1	2	Decreased appetite	.....1	2	Disturbed sleep	.....1	2	
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Disturbed sleep	.....1	2																															

		Don't know.....1.....2 Other (Specify).....1.....2	
K3M8	What do you think cause anaemia or shortage of blood in children? Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned	Malaria .....1 Worms .....2 Lack of diet rich in iron like meat and liver.....3 Not breastfeeding .....4 Don't know .....5 Other (Specify).....6	
K3M9	What are some ways to prevent anaemia or shortage of blood in your child? Note: Do not probe; circle only those answers that are mentioned. Circle <u>ALL</u> responses mentioned	.....Y N Treating Malaria .....1 2 Deworming .....1 2 Improving diet to include iron rich foods.....1 2 Exclusive breastfeeding for the first 6 months 1 2 Avoiding diseases and infections .....1 2 Don't know .....1 2 Other (Specify).....1.....2	
K3M10	Have you ever heard of mineral iron?	Yes.....1 No.....2	
K3M11	Do you know food that contain mineral iron?	Yes.....1 No.....2 I am not sure.....3	2,3 → END
K3M12	If yes which food are rich in Iron?  Read responses.	Y.....N Meat, fish and chicken.....1.....2 Eggs .....1.....2 Dark green leafy vegetables .....1.....2 Beans and peas.....1.....2 Fortified flour (CSB).....1.....2 Breast milk.....1.....2 Don't know .....1.....2 Others (specify).....1.....2	

FIRST PERCEPTION:			
E3P1	Did you notice a change in colour when MNP was added to food?	Yes.....1 No.....2 I am not sure.....3	If 2 skip E3P3
E3P 2	If colour change, what colour did it change to ?	Yellow.....1 Brown .....2 Red .....3 White .....4 Don't Know.....5	
E3P3	Did the food change taste when MNP was added?	Yes.....1 No.....2	If 2 skip E3P5

E3P 4	If taste changed, what was the taste ?	Sour .....1 Sweet.....2 Don't know .....9	
E3P5	Does MNP remind you of something you already know?	Yes.....1 No.....2 I am not sure.....3	2,3↔ E3P7
E3P6	If BC5 is Yes then what is it? Please describe.		
E3P7	In relation to the instructions of how to use MNP –Are they easy to follow?	Yes.....1 No.....2	
E3P8	Do you think the other household members will be able to follow the instructions of how to use the MNP for the young child?	Yes.....1 No.....2 I am not sure.....3	
E3P9	What do you think about the packaging. Do you feel attraction for it?	Yes.....1 No.....2 I am not sure.....3	
E3P10	Do you feel dislike for the package?	Yes.....1 No.....2 I am not sure.....3	
E3P11	Would you prefer a different color of packaging?	Yes.....1 No.....2 I am not sure.....3	2, 3↔ E3P 13
E3P12	If you prefer a different colour, which colour should it be?	Yellow.....1 Green.....2 Blue .....3 Red.....4 Black.....5 Others -Specify.....6 _____	
E3P13	Do you think the label should be different?	Yes.....1 No.....2 I am not sure.....3	2,3↔ END
E3P14	If BC13 is Yes, please describe what the label should be like.		

Question code	Please provide any other comments about MNP and the interview:
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END OF THE SECOND SURVEY OF THE HOUSEHOLD. PLEASE, THANK THE MOTHER OR CARETAKER AND REMIND HER THAT THE CHILD SHOULD FINISH THE REMAINING MNP TAKING ONE SACHET DAILY



NB: MAKE SURE TO CORRECT ANY MISUSE OF AND MISUNDERSTANDING ON THE MNP, (REMARKS COLUMN) AND TO ANSWER TO ALL OF THE CAREGIVERS' QUESTIONS, IF ANY.

NB :Please inform the caregiver or the mother that the side effects mentioned in S3E4 to S3E8 may not be due to the MNP. However, there is a possibility that they may be due to the MNP. Changes in stool colour, loose stool, constipation and abdominal discomfort can happen especially if they are not used to iron and vitamin C supplements. These side effects should diminish with time, are rarely reported and are not harmful to health.

## Annex 3: Education Material

### 1) What happens when there isn't enough iron?

- Iron helps a child to make blood in the body
- When a child does not have enough iron, their brains can't grow as fast and they are weaker and more tired
- Low iron stops a child from learning as fast and they can't grow as strong and healthy

### 2) What are MNP?

- MNP are packages of dry powder that has no taste
- This powder has many vitamins and minerals to help make babies strong and smart
- The vitamins inside are iron, zinc, vitamin A, folic acid and vitamin C which help children to have strong blood, more energy and protects them from getting sick
- The child's caregiver should give one sachet each day to any child that is under five years old, mixed in their food

### 3.) Vitamins and Minerals in MNP

<b>Vitamins</b>	<b>Average %</b>
Vitamin A	30
Vitamin D3	30
Vit. E	10
Vitamin K1	30
Vitamin B1	25
Vitamin B2	25
Vitamin B6	25
Vitamin B12	25
Niacin	10
Folic acid	25
Vitamin C	20
<b>Minerals</b>	<b>Average %</b>
Iron	10
Zinc	10
Copper	10
Selenium	10
Iodine	20

### 4) How to give the MNP?

- Try to remember to give the MNP once every day
- Tear open the top of the package
- Pour contents of the package into a small portion of the child's food after it has been cooked and is no longer steaming hot and put the empty sachet back to the box with the micronutrient.
- Mix the MNP with an amount of food that the child can consume at a time.
- Make sure the child has eaten all the food with the MNP in it within 2 hours
- Do not reheat the food when you have added MNP to it
- Mix the food well after you have added the package of MNP
- Give one full package each day at any mealtime
- Do not share the food with MNP with other people in the family because the child will not get enough.



1



2



3



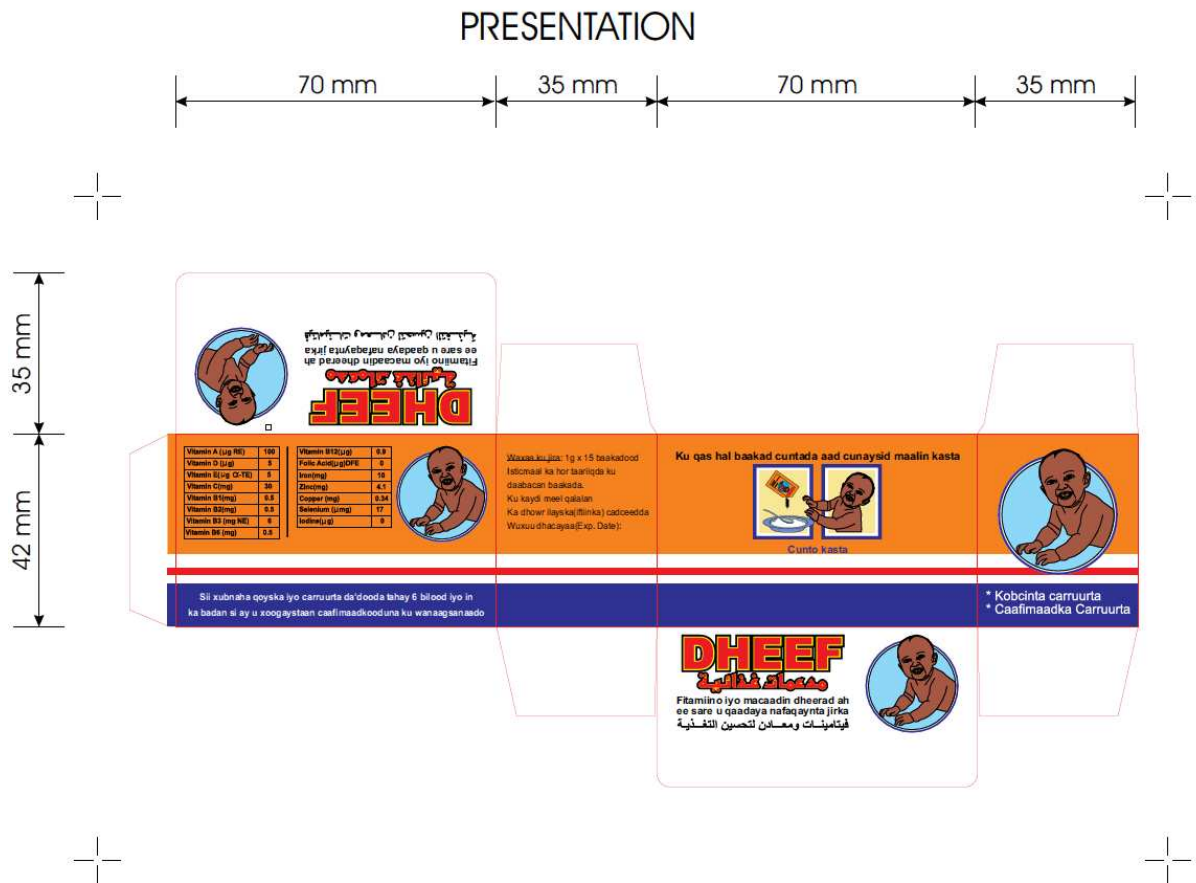
4

### 5) Who should be given the MNP

This product is for all children between 6 months and 59 months (>5yrs) but in order to ensure that the target population accepts the product, understands its purpose and uses the product as intended, UNHCR will conduct an acceptability and perception in seven blocks in the camp and one village in the surrounding areas for a period of one months.

If the product is found to be acceptable, from the acceptability test it will be used to design of a large-scale distribution programme to all eligible children with a culturally appropriate, context-specific communication campaign to ensure proper use of product and high adherence and acceptability.

# Annex 4: The MNP Large packet design



# Annex 5. Small Packet Design

