

**Evaluation of the supplementary feeding programme
targeted at moderately malnourished children aged 6 to 59 months
in Baringo County, Kenya**

by

Irene Wairimu Kimani



*Thesis presented in partial fulfilment of the requirements for the
degree Master of Nutrition at the University of Stellenbosch*

UNIVERSITEIT
iYUNIVESITHI
STELLENBOSCH
UNIVERSITY

100
1918 · 2018

Supervisor: Mrs RA Beukes

Co-supervisor: Dr Peninah Masibo

Co-supervisor: Dr Stellamaris Muthoka

Faculty of Medicine and Health Sciences

Department of Global Health

Division of Human Nutrition

December 2018

DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the sole author thereof (save to the extent explicitly otherwise stated), that reproduction and publication thereof by Stellenbosch University will not infringe any third party rights and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Date: December 2018

Copyright © 2018 Stellenbosch University

All rights reserved

ABSTRACT

Baringo is a semi-arid county of Kenya faced with moderate food insecurity. The County's global acute malnutrition (GAM) rates have been on a deteriorating trend from 9.6% in 2013 to 21.1% in 2014, with moderate acute malnutrition (MAM) being the most prevalent. A supplementary feeding programme (SFP), which aims to alleviate the condition, has been implemented in the County since 2009. Persistent high malnutrition rates may be an indication that there are factors hindering the success of the programme. To assess this, the researcher conducted an evaluation study of the SFP targeted at moderately malnourished children aged 6 to 59 months. The study objectives were to assess the availability, distribution and utilisation of SFP commodities; to determine whether nutritional counselling was part of the SFP and if the advice was adopted; to assess breastfeeding practices for the moderately malnourished SFP beneficiaries aged 6 to 23 months; to assess the influence of SFP on anthropometric status of the beneficiaries; and to compare actual and expected length of stay of beneficiaries in the programme. A descriptive cross-sectional study design was employed and random sampling used to select participants. Questionnaires were administered to caregivers and anthropometric measurements of beneficiaries taken. Secondary data from health facility records was used to determine length of stay in the programme. The study duration was three and half months.

A total of 407 children aged 6 to 59 months who were beneficiaries of the SFP participated in the study. The study found that almost two-thirds (62.7%; $n = 255$) of the participants received ready-to-use supplementary feeds (RUSF) during the distribution that preceded the study, of which the majority received their rightful fortnight ration of 14 (92 g) RUSF sachets. The fortnight ration did not last for the recommended period for at least a third of the participants, mainly due to sharing with non-SFP-registered household members. Caregivers received nutritional counselling as part of the SFP, but inadequate food access, cultural factors and poor access to health care services limited adoption. Almost all participants were fed on carbohydrate-rich grains 24 hours before the study, with minimal consumption of animal-source proteins. Anthropometric status of beneficiaries would improve whenever there was a consistent supply of SFP commodities, which was evidenced by a reduction in prevalence of underweight and acute malnutrition based on mid-upper arm circumference (MUAC) two weeks after admission. There were frequent stock-outs of SFP commodities at health facilities, hence beneficiaries would miss their rations on some distribution days. Discharge criteria was not adhered to, as more than half of the beneficiaries (57%; $n = 98$) that were discharged a month before the study exceeded the recommended maximum length of stay in the programme (84 days).

Lack of SFP commodities at health facilities and sharing of SFP commodities at household level were key factors limiting the success of the programme. The programme stakeholders should identify sustainable solutions to challenges leading to shortage of the commodities and should link SFP beneficiaries to other food-assistance programmes that target the whole household in order to minimise sharing.

OPSOMMING

Baringo is 'n semi-woestyn gebied in Kenia met 'n matige tekort aan voedselsekerheid. Die streek se koers vir globale akute wanvoeding het van 9.6% in 2013 na 21.1% in 2014 verswak, met matige akute wanvoeding as die algemeenste vorm. 'n Aanvullende Voedingsprogram (AVP) word sedert 2009 hier geïmplementeer met die doel om hierdie toestand te verlig. Voortdurende hoë wanvoedingskoerse kan daarop dui dat daar faktore is wat die sukses van die program kelder. Om dit te evalueer, het die navorser 'n evalueringstudie van die AVP onderneem, gemik op wangevoede kinders tussen 6 en 59 maande in hierdie gebied. Die oogmerke van die studie was om die beskikbaarheid, verspreiding en verbruik van AVP-produkte te bepaal; vas te stel of voedingsberading deel uitmaak van die AVP en of die advies toegepas word; borsvoedingpraktyke in matig wangevoede kinders in die AVP (tussen 6 en 23 maande oud) te evalueer; die invloed van AVP op die antropometriese status van die begunstigdes te ondersoek; en laastens die werklike tydperk wat begunstigdes in die program moet bly met die verwagte tydperk te vergelyk. 'n Beskrywende deursnee studieontwerp is gevolg. Deelnemers is deur ewekansige steekproefneming gekies. Versorgers is gevra om vraelyste te voltooi en die begunstigdes se antropometriese mate is geneem. Gesondheidsorgfasiliteite se rekords is as sekondêre data gebruik om te bepaal hoe lank begunstigdes in die program bly. Die studie het drie en 'n half maande geduur.

Altesaam 407 AVP-begunstigdes tussen 6 en 59 maande het aan die studie deelgeneem. Die studie het bevind dat bykans twee derdes (62.7%; $n = 255$) van die deelnemers voor die aanvang van die studie gebruiksgereed aanvullende voedings (GGAVs) ontvang het. Die meeste het die regmatige rantsoen van 14 (92 g) sakkies GGAV vir twee weke ontvang. Hierdie voorraad het vir minstens 'n derde van die deelnemers nie vir die aanbevole tydperk gehou nie, hoofsaaklik omdat hulle dit met nie-AVP-begunstigdes in die huishouding gedeel het. Versorgers het as deel van die AVP voedingsberading ontvang, maar onvoldoende toegang tot voedsel, kulturele faktore en swak toegang tot gesondheidsorgdienste het die toepassing daarvan beperk. Byna al die deelnemers het in die 24 uur vóór data-insameling, koolhidraatryke grane en minimale bronne van dierproteïen ingeneem. Die antropometriese status het verbeter wanneer daar deurlopende voorsiening van AVP-produkte was, soos gestaaf deur die verlaging in die voorkoms van ondergewig en akute wanvoeding gebaseer op bo-arm-omtrek binne twee weke ná toelating. Die AVP-kommoditeite by die gesondheidsorgfasiliteite was gereeld uit voorraad en gevolglik het begunstigdes nie hul rantsoene op verspreidingsdae ontvang nie. Daar is nie aan die ontslagkriteria voldoen nie – meer as die helfte van die begunstigdes (57%; $n = 98$) wat 'n maand voor die aanvang van die studie ontslaan is, het die aanbevole maksimumtydperk (84 dae) in die program oorskry.

Die sukses van die program is deur twee kernfaktore beperk: 'n tekort aan AVP-voorraad by gesondheidsorgfasiliteite en die deel van produkte op huishoudelike vlak. Die programrolspelers behoort volhoubare oplossings te vind vir uitdagings wat tot 'n tekort aan komoditeite lei en behoort AVP-begunstigdes met ander voedselhulpprogramme te verbind wat op die hele huishouding toegespits is, sodat onderlinge verdeling beperk word.

ACKNOWLEDGEMENTS

Foremost, I would like to express my sincere gratitude to my supervisor Mrs RA Beukes and co-supervisors Dr Peninah Masibo and Dr Stellamaris Muthoka for their continuous support of my Master's research, for their patience, motivation, enthusiasm, and immense knowledge. Their guidance helped me in researching and writing this thesis. I could not have imagined having better supervisors and mentors for my study.

Besides my supervisors, I would like to thank the county nutrition coordinator of Baringo County, Mr Zakayo Kimunge, for his advice and support during the data-collection process. Had it not been for his support, I would not have managed to reach the targeted number of participants.

Last but not the least, I would like to thank my husband, Mr Joseph Gikaru Kimindiri, for his financial and emotional support towards achieving my academic goals and for the constant reminder that I should never give up.

TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	LITERATURE REVIEW	2
2.1	<i>Introduction</i>	2
2.2	<i>Background of the study area</i>	2
2.3	<i>Food and nutrition security situation</i>	3
2.4	<i>Malnutrition</i>	5
2.5	<i>Anthropometric status of children aged 6 to 59 months</i>	6
2.6	<i>Interventions for malnutrition</i>	6
2.6.1	Implementation of SFP	7
2.6.2	Target group	7
2.6.3	Admission criteria	7
2.6.4	Discharge criteria	7
2.6.5	Monitoring	7
2.6.6	Health education to caregivers.....	8
2.6.7	Supplementary foods.....	8
2.6.8	Studies on SFPs	8
2.7	<i>Motivation for the study</i>	9
3	METHODS.....	10
3.1	<i>Aim and objectives</i>	10
3.1.1	Research aim	10
3.1.2	Specific objectives.....	10
3.2	<i>Research questions.....</i>	10
3.3	<i>Study design</i>	10
3.3.1	Descriptive cross-sectional study design	10
3.3.2	Study setting	11
3.3.3	Sampling strategy.....	12
3.3.4	Inclusion criteria	12
3.3.5	Exclusion criteria	13
3.4	<i>Procedures and instruments</i>	13
3.4.1	Duration of data collection	13
3.4.2	Data collection	13
3.4.3	Measurement instruments.....	14
3.5	<i>Data management.....</i>	15
3.5.1	Data quality control and entry	15
3.5.2	Data analysis.....	15

4	ETHICS ISSUES AND LEGAL ASPECTS	16
5	RESULTS.....	17
5.1	<i>Socio-demographic characteristics</i>	<i>17</i>
5.2	<i>Availability and distribution modalities of SFP food commodities at health facility level</i>	<i>18</i>
5.3	<i>Utilisation of SFP food (RUSF) at household level.....</i>	<i>18</i>
5.4	<i>Nutritional counselling and application of knowledge at household level.....</i>	<i>19</i>
5.4.1	<i>Nutritional counselling at health facility level.....</i>	<i>19</i>
5.4.2	<i>Application of nutritional knowledge in the household</i>	<i>20</i>
5.4.3	<i>Caregiver knowledge on purpose of SFP</i>	<i>20</i>
5.5	<i>Breastfeeding practices for moderately malnourished SFP beneficiaries aged 6 to 23 months</i>	<i>21</i>
5.5.1	<i>Complementary feeding practices.....</i>	<i>22</i>
5.6	<i>Change in anthropometric status of moderately malnourished children aged 6 to 59 months.....</i>	<i>22</i>
5.6.1	<i>Weight status</i>	<i>22</i>
5.6.2	<i>MUAC status</i>	<i>23</i>
5.6.3	<i>Height measurements</i>	<i>24</i>
5.7	<i>Length of stay of beneficiaries in the programme.....</i>	<i>24</i>
6	DISCUSSION.....	26
6.1	<i>Interpretation of results.....</i>	<i>26</i>
6.2	<i>Limitations of the study</i>	<i>28</i>
7	CONCLUSION AND RECOMMENDATIONS.....	29
7.1	<i>Availability and distribution modalities of SFP food commodities at health facilities</i>	<i>29</i>
7.2	<i>Utilisation of SFP food (RUSF) at household level.....</i>	<i>29</i>
7.3	<i>Nutritional counselling, knowledge and feeding practices.....</i>	<i>29</i>
7.4	<i>Breastfeeding practices for moderately malnourished SFP beneficiaries aged 6 to 23 months</i>	<i>29</i>
7.5	<i>Effect of SFP on anthropometric measurements of moderately malnourished children aged 6 to 59 months</i>	<i>30</i>
7.6	<i>Length of stay of beneficiaries in the programme.....</i>	<i>30</i>
	REFERENCES	31
	ADDENDA	37
7.7	<i>Addendum 1: Basic Procedures of implementing SFP.....</i>	<i>37</i>
7.8	<i>Addendum 2: Key messages/ action points⁴⁴</i>	<i>40</i>
7.9	<i>Addendum 3: List of health facilities in Baringo County⁵¹</i>	<i>44</i>

7.10	<i>Addendum 4 : Number of moderately malnourished children in Baringo County in December 2014⁵¹...</i>	45
7.12	<i>Addendum 5: Questionnaire</i>	46
7.13	<i>Addendum 6: Data capture sheet.....</i>	53
7.14	<i>Addendum 7: Participant information leaflet and consent form.</i>	56

LIST OF FIGURES

Figure 1: Baringo County livelihood map ¹⁵	3
Figure 2: UNICEF Conceptual framework of malnutrition ³²	5
Figure 3: Flow chart of administrative units in Baringo County	11

LIST OF TABLES

Table 1: Food security status of WFP beneficiaries' households in Baringo County	4
Table 2: Sample size	12
Table 3: Socio-demographic characteristics of children and caregivers	17
Table 4: Distribution of RUSF at health facility level	18
Table 5: Number of days that RUSF lasted	18
Table 6: Reasons why ration ran out before 14 days	19
Table 7: Consumption of RUSF at household level	19
Table 8: Content of nutritional counselling	20
Table 9: Reasons for not applying nutritional advice at household level	20
Table 10: The caregivers' knowledge on the discharge criteria of the SFP	21
Table 11: Breastfeeding practices	21
Table 12: Frequency of breastfeeding	22
Table 13: 24-hour food-consumption recall	22
Table 14: Prevalence of underweight based on weight-for-age z-scores by sex	23
Table 15: Prevalence of acute malnutrition based on MUAC cut-offs by sex	24
Table 16: Length of stay for discharged beneficiaries	25
Table 17: Discharge criteria	25

LIST OF ABBREVIATIONS

CHWs	Community health workers
CI	Confidence interval
CSB	Corn soy blend
CSB++	Corn soy blend plus-plus
ENA	Emergency Nutrition Assessment
FBF	Fortified blended flours
FSOM	Food security outcome monitoring
G	Gram
GAM	Global acute malnutrition
HDI	Human Development Index
HINI	High-impact nutrition intervention
HIS	Health Information system
HIV	Human Immunodeficiency Virus
IMAM	Integrated management of acute malnutrition
IPC	Integrated phase classification
IYCN	Infant and young child nutrition
kcal	Kilocalories
KDHS	Kenya Demographic and Health Survey
kg	Kilogram
km ²	Square kilometres
LTA	Long-term average
MAM	Moderate acute malnutrition
mm	Millimetres
MUAC	Mid-upper arm circumference
OTP	Outpatient therapeutic programme
PDM	Post-distribution monitoring
PEM	Protein energy malnutrition
RUSF	Ready-to-use supplementary food
RUTF	Ready-to-use therapeutic food
SAM	Severe acute malnutrition
SFP	Supplementary feeding programme
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SPSS	Statistical Package for Social Sciences
UNICEF	United Nations Children's Fund
W/A	Weight for age
W/H	Weight for height
WHO	World Health Organization
WHZ	Weight for height z-score
WFP	World Food Programme

CONTRIBUTIONS BY PRINCIPAL RESEARCHER AND FELLOW RESEARCHERS

The principal researcher Ms. Irene Wairimu Kimani developed the idea and the protocol. The researcher planned the study and undertook data collection with assistance from the Community Health Workers (CHWs) based in health facilities in Baringo County. The researcher captured, analysed and interpreted the data with support from her supervisors, Mrs RA Beukes, Dr Peninah Masibo and Dr Stellamaris Muthoka. The supervisors also provided input at all stages and revised the protocol and thesis.

CHAPTER 1

1 INTRODUCTION

Globally, one in nine people (795 million) are undernourished. Poor nutrition causes nearly half (45%) of all deaths in children under five each year. The vast majority of the world's hungry people live in developing countries, where 12.9% of the population is undernourished.¹ In Kenya, the national dietary energy supply barely meets population energy requirements, resulting in undernourishment for a third of the population². Global acute malnutrition (GAM) represents the proportion of children aged 6 to 59 months in the population classified with moderate acute malnutrition (MAM) plus severe acute malnutrition (SAM) according to their weight for height *z*-score (WHZ) and/or nutritional oedema³. In arid and semi-arid areas of Kenya, GAM among children under five exceeds 15% and many households cannot afford a nutritious diet, with stunting persisting at 26%⁴. In October 2013, the prevalence of GAM in Baringo, one of Kenya's semi-arid counties, was 9.6%⁵, which signified a malnutrition crisis in the County⁶. By June 2014, the GAM rates had deteriorated to critical levels (21.1%) in East Pokot Sub-county⁷.

The county government of Baringo has been implementing a targeted supplementary feeding programme (SFP) at health facilities, with support from the World Food Programme (WFP) since 2009. The programme aims at preventing moderately malnourished children aged 6 to 59 months from becoming severely malnourished through the provision of food donations to supplement household diet. The WFP conducts monthly monitoring of the programme, focusing on logistics of delivery, distribution and utilisation of the food donations, while the county government is mandated to monitor the results of the programme⁸. Persistently high malnutrition rates may be an indication that there are factors hindering the success of the programme. This study aimed to evaluate the programme to answer the question: How is the SFP targeted at moderately malnourished children aged 6 to 59 months in Baringo County performing? The objectives of the study were to assess the availability, distribution modalities and utilisation of SFP food commodities; to determine whether nutritional counselling on infant and young child nutrition (IYCN) was part of the programme implementation package and if the advice was adopted at household level; to assess breastfeeding practices for moderately malnourished SFP beneficiaries aged 6 to 23 months; to assess the influence of SFP on anthropometric status of the beneficiaries; and to compare the actual and expected length of stay of beneficiaries in the programme. Secondary data from health facility records were used to determine length of stay in the programme, while primary data on nutritional counselling, breastfeeding practices, distribution and utilisation of SFP food commodities were collected using questionnaires. The results of the study will be useful in informing stakeholders on the performance of SFP to support decision-making. The study assumed that the participants were only benefiting from the programme to alleviate moderate malnutrition.

This thesis is organised into six chapters. Chapter 1 gives an overall overview of the study. The literature review in Chapter 2 details the theoretical base relevant to the study topic. Chapter 3 systematically explains the methods that were applied in conducting the study, while Chapter 4 highlights ethics and legal aspects of the study. Chapter 5 objectively outlines the results and key findings while the interpretation of the findings is discussed in Chapter 6. Chapter 7 summarises the study findings and makes recommendations for SFP implementation and future research.

CHAPTER 2

2 LITERATURE REVIEW

2.1 INTRODUCTION

The literature review covers the geographical context, climatic conditions and food and nutrition security of the study area. The review further explains the different types of malnutrition, with a particular focus on moderate malnutrition and the strategies in place to alleviate the problem. A detailed explanation of the SFP outlines the purpose and implementation guidelines of the programme. A review of previous studies focuses on related studies on SFPs and briefly outlines the results of these studies.

2.2 BACKGROUND OF THE STUDY AREA

Kenya is the world's forty-seventh largest country⁹. It is situated in the eastern part of the African continent and lies between 5° N and 5° S and between 24° and 31° E. The equator passes through the middle of the country, separating the upper and lower parts almost equally. Kenya borders Ethiopia (north), Somalia (northeast), Tanzania (south), Uganda (west) and South Sudan (northwest). The country covers a total of 582 646 square kilometres (km²), of which 571 466 km² are dry land area⁴. The country had a population of 38.6 million people by August 2009¹⁰. The World Bank reclassified Kenya from a low income to lower middle income economy in September 2014, making it one of the largest economies in sub-Saharan Africa¹¹. In 2015, Kenya was ranked in the low human development category, positioned at 147 out of 187 countries and territories, which according to the Human Development Index (HDI) was a 0.55% improvement compared to the previous year. The HDI is a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living¹². Despite these improvements, Kenya remains a food-insecure country due to high poverty rates and income inequalities¹³.

Kenya has a tropical climate moderated by diverse topography in the west. The country's topography rises from the coastal plains to the eastern edge of the East African Plateau and the Great Rift Valley. The central highlands are substantially cooler than the coast, with the coolest (highest altitude) regions at 15 °C compared with 29 °C at the coast. Kenya experiences two distinct wet periods, the short rains in October to December and the long rains in March to May. The amount of rainfall received in these seasons is generally 50–200 millimetres (mm) per month but varies greatly, exceeding 300 mm per month in some localities. The onset, duration and intensity of these rainfalls also vary considerably from year to year¹⁴.

Baringo County borders Turkana and Samburu to the north, Laikipia to the east, Nakuru and Kericho to the south, Uasin Gishu to the south-west, and Elgeyo-Marakwet and West Pokot to the west. The County covers an area of 11 015.3 km² with an estimated population of 555 561 people in 2009¹⁰. The County, which includes 165 km² of Lake Baringo, Lake Bogoria, Lake Kamnarok and Lake 94, is divided into six sub-counties, namely Mogotio, Baringo Central, Baringo North, Koibatek, Marigat and East Pokot, also known as Baringo East. The County comprises four livelihood zones, namely mixed farming (43% of the population), pastoral (31%), agro-pastoral (22%) and irrigated cropping (4%) (Figure 1)¹⁵.

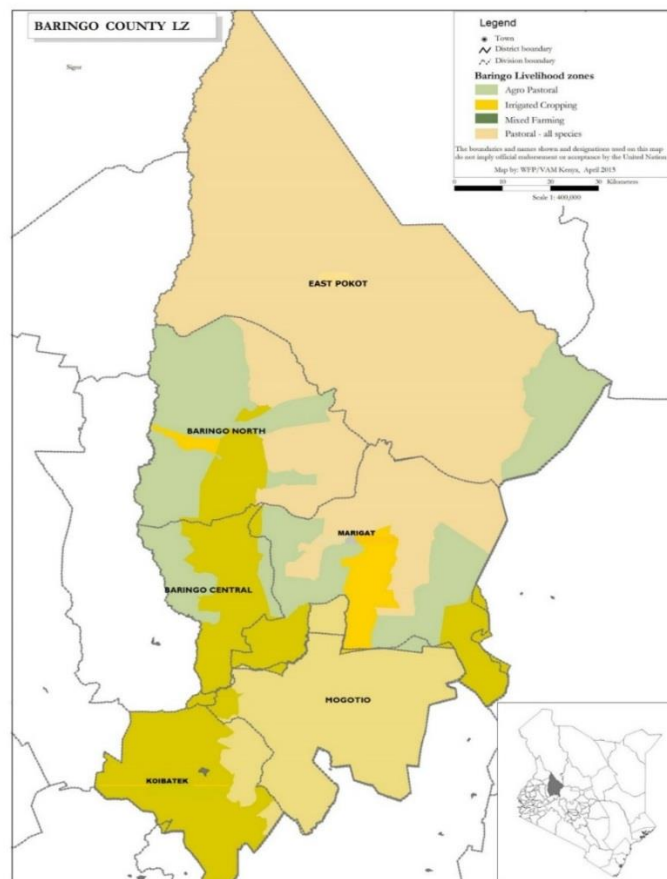


Figure 1: Baringo County livelihood map¹⁵

Climate change is an important factor influencing agriculture in the County. Temperatures range from 10 °C in the Tugen highlands to 37 °C in the lowlands. The highlands receive high rainfall while the lowlands or plains are very dry. The County has a highly erratic bimodal rainfall pattern with long rains being the most depended on for crop production. During the dry months (January to March), farmers prepare land for planting and there is minimal calving, lambing and kidding. Planting as well as most kidding, lambing, minimal calving and honey harvesting take place during long rains. During short rains, most calving and honey harvesting takes place with minimal kidding and lambing. Pre-harvesting and harvesting begins in the month of July and proceeds up to the end of the year¹⁶. In the valley with its alluvial soils, ground and run-off water catchments support irrigated crop production¹⁷. Currently, only 4.54% of the population in Baringo County benefits from irrigated cropping¹⁵.

2.3 FOOD AND NUTRITION SECURITY SITUATION

Globally, agriculture is the largest source of income and jobs for poor households and is recognised as the single largest employer, providing livelihoods for 40% of the population¹⁸. About eighty per cent of Kenya's land area is arid and semi-arid with the remaining high potential portion supporting 80% of the population. The Food and Agriculture Organization (FAO) considers stagnation of food production, unfavourable economic environment and poverty as the major causes of food insecurity in the country². In the recent years, civil unrest, drought and high food prices have left vulnerable farmers and pastoralists even more at risk¹⁹.

The WFP assesses the impact of its food-assistance programmes on household food security every quarter through food security outcome monitoring (FSOM) surveys. Following the December 2013 FSOM survey, Baringo County, which falls in the western agro-pastoral livelihood cluster, was classified as having moderate food insecurity. Although there was a slight improvement in food security status towards the end of 2014, the same was not true for early and mid-2014 (Table 1)²⁰.

Table 1: Food security status of WFP beneficiaries' households in Baringo County

	% of beneficiary households moderately food insecure	% of beneficiary households severely food insecure	% of beneficiary households food secure	% of beneficiary households marginally food secure
December 2013	74	21	5	0
May 2014	41	18	6	35
December 2014	18	2	20	60

Data sourced from December 2013²¹, May²⁰ and December 2014²² FSOM survey reports

The 2013 Short Rains Food Security Assessment reported rains amounting to 80–120% of long-term average (LTA), leading to flooding in areas surrounding Lake Baringo, loss of crops and consequently displacement of persons²³. Food insecurity due to cattle rustling and conflict for pastures was also rampant in the County, especially along the borders, where different communities neighbour each other. This led to displacement of people, thus frustrating agricultural activities. As a result, beneficiaries of food-assistance programmes in the County were targeted based on locality¹⁵.

The 2014 Long Rains Food Security Assessment classified mixed farming and irrigated cropping livelihood zones as stressed/integrated phase classification 2 (IPC phase 2) and pastoral and agro-pastoral zones as crisis (IPC phase 3)²⁴. The County received below normal long rains, amounting to 25–70% of the LTA. This led to poor pasture regeneration, poor animal body condition and crop failure. Consequently, indicators of food security including household milk consumption, water availability and children at risk of malnutrition deteriorated. Based on mid-upper arm circumference (MUAC) of < 135 mm, the children at risk of malnutrition were 17.6% in July 2014 compared to the LTA of 16.6%. The assessment team therefore recommended a continuation of the SFP which had been running since 2009²⁴.

2.4 MALNUTRITION

Malnutrition is grouped into two major categories, namely over nutrition and undernutrition. In this study, malnutrition will refer to undernutrition. Undernutrition is divided into two major categories, namely micronutrient malnutrition and protein energy malnutrition (PEM). Micronutrient malnutrition refers to diseases caused by dietary deficiency of vitamins and minerals. Worldwide, the three most common forms of micronutrient malnutrition are iron, vitamin A and iodine deficiencies²⁵. The PEM develops in children whose consumption of protein and energy is insufficient to satisfy their nutritional needs²⁶. It manifests itself as underweight, wasting and stunting. Underweight is defined as weight for age (W/A) of below minus two standard deviation (< -2) of the World Health Organization (WHO) child growth standards median²⁷. Wasting is a reduction or loss of body weight in relation to height²⁸. Weight for height (W/H) is the most appropriate index to quantify wasting in a population of children and reflects the current nutrition and health status of the community. Therefore, GAM as measured by W/H is the recommended indicator of acute malnutrition²⁹. MAM in children aged 6 to 59 months refers to children with a z -score for W/H of ≥ -3 and < -2 or MUAC of ≥ 115 mm and < 125 mm. SAM represents the proportion of children aged 6 to 59 months in the population who are classified with W/H of < -3 (z -score) and/or presence of nutritional oedema³⁰.

As illustrated in Figure 2, the immediate causes of malnutrition are inadequate dietary intake and disease. Inadequate access to food and poor child and women care practices are underlying causes of malnutrition that result in inadequate dietary intake. The absence of proper care in households and communities, coupled with insufficient health services and unhealthy environment, cause malnutrition that leads to disease. Political and ideological factors determine how accessible human, economic and organizational resources are within a society. These factors determine how accessible health care and food are to household, and are hence considered basic causes of malnutrition³¹.

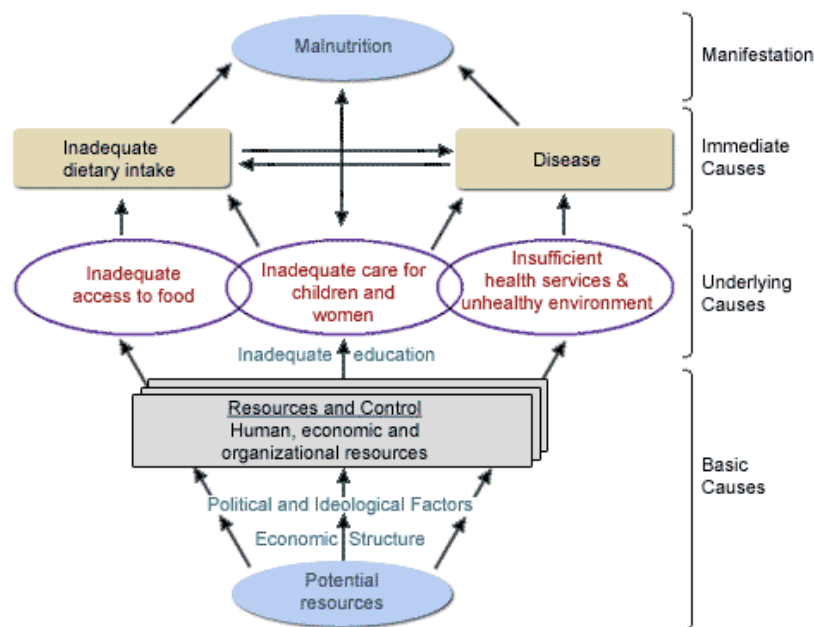


Figure 2: UNICEF Conceptual framework of malnutrition³²

2.5 ANTHROPOMETRIC STATUS OF CHILDREN AGED 6 TO 59 MONTHS

Globally, 7.7% of children under five (52 million) were wasted and 17 million severely wasted in 2011. More than two-thirds (69%) of all wasted children under five years old lived in Asia and more than one quarter (27%) lived in Africa.³³ An analysis of global trends in the prevalence of child underweight covering the period 1990 to 2000 showed a decline in underweight from 27% to 22%³⁴. In Africa, the number of underweight children increased from 25 million to 31 million between 1990 and 2008³⁵. Stunting, or being too short for one's age, is defined as a height that is more than two standard deviations below the WHO child growth standards median³⁶. Globally, 22.9% of children under five (154.8 million) were stunted in 2016. The global trend in stunting prevalence and numbers affected is decreasing. Between 2000 and 2016, stunting prevalence declined from 32.7% to 22.9%. In 2016, more than half (56%) of all stunted children under five lived in Asia and more than a third (38%) lived in Africa. Stunting rates in Africa slowly decreased from 38.3% in 2000 to 31.2% in 2016.³⁷

The 2014 Kenya Demographic and Health Survey (KDHS) reported that 26% of Kenyan children were stunted, while 8% were severely stunted. The national wasting prevalence was estimated at 4% and severe wasting at 1%. The KDHS further reported that 25.9% of children in Baringo County were stunted, while 8.4% was severely stunted. In the same county, 6.9% of the children was classified as having MAM, while 1.2% was classified as having SAM.⁴

2.6 INTERVENTIONS FOR MALNUTRITION

The high-impact nutrition intervention (HINI) approach is used as a means of ensuring maternal infant and young child nutrition at various key contact points, including antenatal clinic, delivery, post-natal/family planning, immunisation, growth monitoring and sick child consultations³⁸. The HINI approach comprises 11 components that nutrition stakeholders focus on for an integrated multilevel approach to alleviate malnutrition. The components include exclusive breastfeeding, complementary feeding, hand washing, iron folate supplementation, vitamin A supplementation, multiple micronutrient powders, zinc supplements for management of diarrhoea, deworming, food fortification of local staples, salt iodisation and integrated management of acute malnutrition (IMAM).³⁹

The SFP is a component of IMAM that aims to rehabilitate moderately malnourished people or to prevent a deterioration of nutritional status of those most at risk by meeting their additional needs, focusing particularly on young children, pregnant women and lactating mothers⁴⁰. The WFP's mission in nutrition is to work with partners to fight undernutrition by ensuring physical and economic access to a nutritious and age-appropriate diet for those who lack it and to support households and communities in utilising food adequately. To accomplish this mission, the WFP supports both blanket and targeted SFPs in Kenya. Blanket SFPs focus on preventing widespread malnutrition and related mortality in nutritionally vulnerable groups by providing a supplementary ration for all members of the affected group, while targeted SFPs target members of the affected group who have MAM.³⁰ In Baringo County, the WFP supports targeted SFPs which aim at preventing the moderately malnourished from becoming severely malnourished through provision of food donations to supplement the household diet of moderately malnourished pregnant and lactating women as well as children aged 6 to 59 months³. The WFP supports SFPs through food donations while the government, through the Ministry of Health, is responsible for the actual implementation of the programme at health-facility level.

2.6.1 Implementation of SFP

A targeted SFP should be implemented when one or more of the following situations occur: there is a high GAM rate of 10–14% among children or a GAM rate of 5–9% and the presence of aggravating factors such as poor food security and high rates of disease⁴⁰. The SFP provides specialised nutritious food to individuals on a regular basis according to specific admission and discharge criteria based on nutritional status. The programme works in synergy with other health services, including medical screening for conditions that need further treatment, immunisation, micronutrient supplementation and nutritional counselling. Anthropometric measurements of SFP beneficiaries are monitored biweekly until individuals meet the discharge criteria. If their nutritional status deteriorates or stays the same, individuals are often referred for SAM treatment or for medical treatment to address underlying illnesses.³⁰ (See Addendum 1 for an outline of the basic procedure for implementing an SFP.)

2.6.2 Target group

The primary target group for a targeted SFP is mild or moderately malnourished children who are 6 to 59 months old. Among other groups which may be covered are pregnant and lactating women who are nutritionally vulnerable for medical or social reasons.³⁰

2.6.3 Admission criteria

The recommended admission criteria for SFPs are MAM, classified as $W/H \geq -3$ and < -2 z-score according to WHO standards and a MUAC of ≥ 115 mm and < 125 mm for children aged 6 to 59 months⁴¹.

2.6.4 Discharge criteria

Once a beneficiary is admitted into the programme, MUAC and weight measurements are monitored every two weeks and height measurements every four weeks. Caregivers are encouraged to take their children to the child welfare clinic for growth monitoring and immunisation as part of managing moderate malnutrition. Discharge from the programme is dependent on whether the beneficiary has attained W/H of > -2 z-score or a MUAC of > 125 mm for two consecutive visits, at which point the beneficiary is discharged as cured. In order to determine the actual performance of the nutrition relief programme, it is recommended that nutritional assessment is conducted at the end of the programme period to determine the extent to which the nutritional problem has been reduced.

One of the performance indicators for SFPs is the length of stay in the programme. The acceptable length of stay in the programme is 8 to 12 weeks (56 to 84 days). A length of stay of more than 12 weeks is considered alarming⁴². If beneficiaries do not achieve the discharge criteria (cured) within 8 to 12 weeks, they are discharged from the programme as non-recovered but are referred for further medical check-ups and follow-up by community health workers (CHWs) on the possible causes of non-recovery. Recovery rates also help in determining the performance of the nutrition relief programme. The minimum standard for SFP recovery rate is $> 75\%$ per month⁴³. At the end of every month, every health facility should record recovery rates in the monthly reports⁴⁴. Other discharge criteria are defaulting, death and transfer to an outpatient therapeutic programme (OTP) or to another SFP site⁴¹.

2.6.5 Monitoring

The WFP in collaboration with implementing partners should undertake outcome and process post-distribution monitoring (PDM) of all the organisation's food-assistance programmes. Data

is collected at the household level as well as through group discussions and/or key informant interviews after food distribution. Process PDM assesses beneficiary access to, use of and satisfaction with both the food assistance itself and the process of receiving the assistance. Outcome PDM collects outcome data for food security and livelihood (assets creation) indicators. Distribution monitoring, which includes direct observation and beneficiary contact monitoring during the actual distribution process of food, cash and/or vouchers, determines whether timely and orderly distributions are occurring.⁸

2.6.6 Health education to caregivers

The IMAM guideline requires that the caregiver must receive adequate information about the cause of child malnutrition based on the guidelines and how to avoid a relapse. After nutritional counselling, the health care worker should ask the caregiver to explain what they will do at home. This is to make sure they understand the new practices.⁴⁴ The health care worker at health facility level should inform the CHW about the counselling messages for follow-up purposes. The child caregiver should be advised by the health workers on optimal breastfeeding, optimal complementary feeding, maternal nutrition, vitamin A supplementation, iron folate supplementation, hygiene and sanitation, deworming and growth monitoring. The caregiver should be informed on daily ration sizes, entitlements, the reasons why their child is admitted into the programme and the requirements for discharge.⁴⁵ (These key topics, messages and action points are outlined in Addendum 2).

2.6.7 Supplementary foods

Supplementary foods are specially formulated foods, in the ready-to-eat or milled form, which are modified in their energy density, protein and fat or micronutrient composition to help meet the nutritional requirements of specific populations⁴⁶. The WFP provides ready-to-use supplementary food (RUSF) in the form of lipid-based paste for moderately malnourished children aged 6 to 59 months. The RUSFs are better suited to meet the nutritional needs of young and moderate malnourished children than fortified blended flours (FBF). The key ingredients of RUSF are peanuts, sugar, whey, vegetable oil, milk, soy protein, vitamins and minerals. The RUSFs distributed by the WFP may contain vegetable fat, dry skimmed milk, maltodextrin, sugar and whey. The daily ration of RUSF is a 92 gram (g) sachet of which the nutrient profile [500 kilocalories (kcal), 13 g protein (10%), 31 g fat (55%), essential fatty acids] meets the minimum 70% recommended nutrient intake and protein digestibility corrected amino acid score.⁴⁷ The recommended caloric intake for children aged 6 to 59 months is 645 to 1545 kcal per day. The daily ration of RUSF also provides micronutrients, including vitamin A, E, B₁, B₂, niacin, pantothenic acid, vitamin C, B₆, B₁₂, calcium, magnesium, selenium, zinc, iron, iodine, copper, phosphorus, potassium, manganese, folic acid, vitamin D, vitamin K and biotin. The paste is consumed directly from the sachet by kneading the sachet, tearing it open and squeezing the contents out for consumption. Although RUSF is meant for children aged 6 to 59 months who are moderately malnourished only, it has been found that products are shared among other members of the family.⁴⁸

2.6.8 Studies on SFPs

Moderately malnourished children aged 6 to 59 months were included in a Malawian study to assess the effectiveness of novel FBF fortified with oil and skimmed milk powder, corn-soy blend plus-plus (CSB++) compared to lipid-based RUSF. The study found that CSB++ was not inferior to a locally produced soy RUSF and an imported soy/whey RUSF in facilitating recovery

from MAM. However, the recovery rate observed for CSB++ was higher than that for any other FBF tested previously. Previous studies in Malawi found that recovery rates of children with MAM often treated with FBF, mainly Corn-Soy Blend (CSB), remained 75% lower than the rate achieved with peanut paste-based RUSFs.⁴⁹

The effectiveness of preventive supplementation with ready-to-use therapeutic food (RUTF) on the nutritional status, mortality and morbidity of children aged 6 to 60 months with W/H 80% or more of the National Centre for Health Statistics reference median was studied in 12 villages in Niger. Six villages were randomised to intervention compared to six who did not receive intervention. The main outcome measure was a change in WHZ. The difference in WHZ between the intervention and non-intervention groups was -0.10 z (95% confidence interval [CI]; -0.23 to 0.03) at baseline and 0.12 z (95% CI; 0.02 to 0.21) after eight months of follow-up. The researchers concluded that short-term supplementation of non-malnourished children with RUTF reduced the decline in WHZ as well as the incidence of wasting and severe wasting over eight months.⁵⁰

The national FSOM survey that was conducted in Kenya in December 2013 reported results in livelihood clusters. Baringo County was classified under the western agro-pastoral cluster. Only 17% of the children aged 6 to 23 months in the livelihood cluster had consumed foods rich in iron 24 hours prior to the interview. Breastfeeding was highest for children aged 6 to 11 months; 65% of mothers reported that they continued breastfeeding their children after introduction of complementary feeds. Fifty per cent of mothers continued breastfeeding for up to 12 to 15 months after birth, while only 44% continued breastfeeding for children 16 to 23 months of age. The study did not give detailed results of the performance of SFPs in the country but highlighted that the admission rates to SFPs for moderately malnourished children and pregnant/breastfeeding women had been stable throughout the year²¹.

2.7 MOTIVATION FOR THE STUDY

The purpose of this literature review is to help the reader understand the context of the study. It is clear from the review that implementation and monitoring guidelines of the SFP are well articulated by the various coordinating authorities. However, the high malnutrition rates in Baringo County, where the programme has been under implementation since 2009, is an indication that there are factors that may be hindering the success of the programme. Related studies do not evaluate the performance of SFPs on implementation modalities and impact on nutritional status. This study evaluated the performance of the SFP targeted at moderately malnourished children aged 6 to 59 months in Baringo County.

CHAPTER 3

3 METHODS

3.1 AIM AND OBJECTIVES

3.1.1 Research aim

The aim of the study was to evaluate the SFP targeted at moderately malnourished children in Baringo County, Kenya.

3.1.2 Specific objectives

The objectives of this study were to:

- i. assess the availability and distribution modalities of SFP food commodities at health facilities;
- ii. assess utilisation of SFP food (RUSF) at household level;
- iii. determine whether nutritional counselling of caregivers on IYCN was included at health facilities;
- iv. determine whether nutritional counselling to caregivers IYCN was adopted at household level;
- v. assess the breastfeeding practices for moderately malnourished SFP beneficiaries aged 6 to 23 months;
- vi. assess the change in anthropometric measurements of moderately malnourished children aged 6 to 59 months as influenced by the SFP; and
- vii. compare the length of stay of beneficiaries in the programme with the expected length of stay.

3.2 RESEARCH QUESTIONS

The study aimed to answer the following questions:

- i. Were SFP food stock levels sustainable so that beneficiaries could receive SFP commodities with every follow-up visit throughout the duration of their stay on the programme?
- ii. How were RUSF utilised at household level?
- iii. Did caregivers receive nutritional counselling on IYCN and did they put it into practice at household level?
- iv. Were the children aged 6 to 23 months breastfed? How long did the mother intend to continue breastfeeding the child?
- v. Was there a change in anthropometric status of moderately malnourished SFP beneficiaries aged 6 to 59 months as influenced by SFP?
- vi. What was the average length of stay of beneficiaries in the SFP?

3.3 STUDY DESIGN

3.3.1 Descriptive cross-sectional study design

A descriptive cross-sectional study design was employed to conduct an evaluation of the SFP in Baringo County. Information was collected at one point in time. Anthropometric measurements

of SFP beneficiaries were collected and caregivers were interviewed on food distribution days at the health facilities.

3.3.2 Study setting

The study was conducted in Marigat, Baringo Central, Baringo North and East Pokot sub-counties, where the SFP was actively operational (Figure 3). The programme had not yet started in Koibatek Sub-county and had only recently started in Mogotio, hence the two sub-counties were not included in the study. However, the pilot study was conducted in Mogotio Sub-county. As reflected in Addendum 3, the sub-counties had a total of 61 health facilities implementing SFP; 26 in Baringo Central and Marigat, 16 in Baringo North and 19 in East Pokot⁵¹.

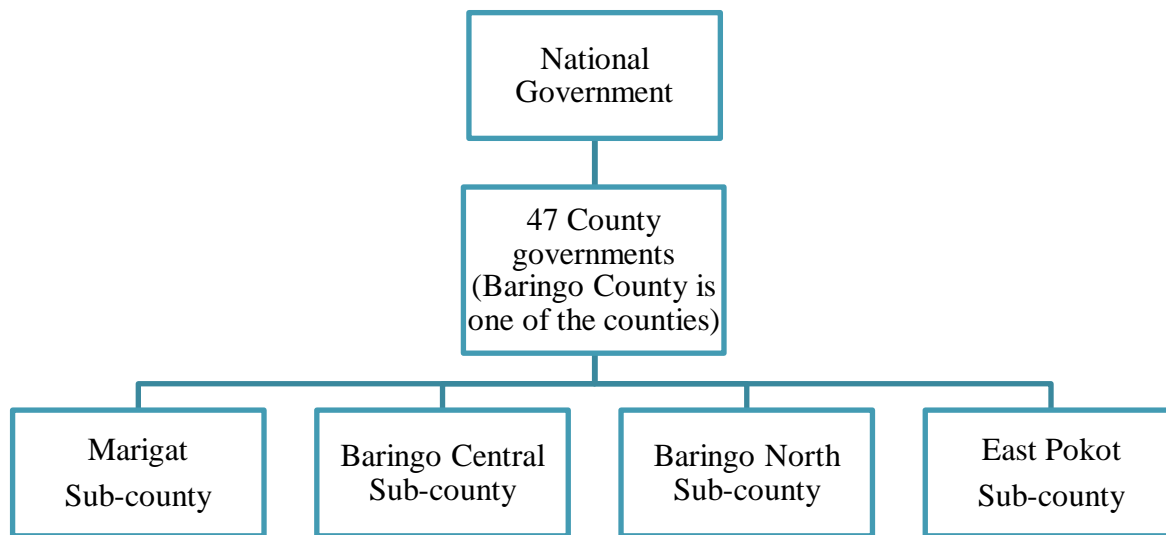


Figure 3: Flow chart of administrative units in Baringo County

A descriptive cross-sectional study design was suitable for the study setting due to the poor infrastructure, poor terrain and vastness of the County. The access to health facilities was poor; most of the population had to cover long distances (above 5 km) to access health facilities⁵². The design enabled collection of all the required data from the participant at one point in time. The study was descriptive because it would have been unethical to include a control group of moderately malnourished individuals in the study without enrolling them into the programme.

The population data that was used for the study was sourced from the County's Health Information System (HIS). The HIS data are normally updated monthly from the health facility records and therefore was considered the most accurate source of data. A sample was drawn from a population of 3 086 children aged 6 to 59 months who were moderately malnourished by December 2014 as per the HIS (Addendum 4)⁵¹. Addendum 4 also shows the distribution of the population from which the sample was drawn, according to admission criteria.

3.3.3 Sampling strategy

Two health facilities were randomly sampled from each ward in a sub-county. Sampled health facilities that did not have SFP supplies to last for at least two reviews were excluded from the study. East Pokot Sub-county was the most affected. For this reason, the data collection took a longer period (3½ months) as the researcher had to move across the County identifying sampled facilities that had SFP commodities. (Health facilities that were included in the study are highlighted in blue in Addendum 3). At health facility level, convenient sampling was used to select participants so that all children who were enrolled in the programme at least a month before the study were included in the study until the required number was achieved.

Considering the variance in number of children enrolled in SFPs per sub-county, proportional random sampling stratified by geographical location (sub-counties) was used. The population of 3 086 moderately malnourished children was distributed across the four sub-counties as follows: 176 (6%) in Baringo Central and Marigat, 362 (12%) in Baringo North, 72 (2%) in Mogotio and 2 476 (80%) in East Pokot (see Addendum 4). The number of sampled SFP beneficiaries per sub-county was proportional to the population size per sub-county. A total sample size of 496 participants was determined using the formula in Table 2 below⁵³.

Table 2: Sample size

$n = \frac{p(1-p)z^2}{d^2}$	Baringo Central and Marigat
n = sample size	$n = \frac{0.06(1-0.06)1.96^2}{0.05^2} = \mathbf{87}$
P = anticipated population proportion	Baringo North $n = \frac{0.12(1-0.12)1.96^2}{0.05^2} = \mathbf{163}$
z = cut-off value of normal distribution (1.96)	East Pokot $n = \frac{0.8(1-0.8)1.96^2}{0.05^2} = \mathbf{246}$
d = acceptable margin of error (0.05)	

3.3.4 Inclusion criteria

The following criteria was used to select participants who qualified for the study;

- Moderately malnourished children aged 6 to 59 months who had been admitted in the SFP at least a month before the study. Those who had been in the programme for less

than a month were not included in the study since they may not have provided accurate information on the availability of SFP commodities and the period that they had been in the programme may not have been sufficient to show change in nutritional status.

- Participants were aged 6 to 59 months and were moderately malnourished according to the WHO definition, implying a W/H of between -3 and -2 SD of the mean W/H of the WHO reference population and/or MUAC ≥ 115 mm and < 125 mm.
- Availability of records of beneficiaries who were discharged from the programme within one month before the study to enable the researcher to determine their length of stay in the programme.

3.3.5 Exclusion criteria

The following exclusion criteria was used to exempt SFP beneficiaries from participating in the study;

- Beneficiaries of SFP who had been in the programme for less than one month
- Beneficiaries on the SFP whose caregivers were not willing to give consent for the children to take part in the study.
- Beneficiaries whose admission measurements were not available in either the health facility registers or ration cards.
- Beneficiaries who were not accompanied by the primary caregiver, as other people could not have been able to give accurate information on dietary intake.
- Premature babies and children whose mothers had the human immunodeficiency virus (HIV), as their growth could have been compromised.

3.4 PROCEDURES AND INSTRUMENTS

3.4.1 Duration of data collection

It was anticipated that data collection would take a period of three weeks, but due to a shortage of SFP supplies at health facility level, beneficiary turnout was low, consequently increasing the duration of data collection to three and a half months. The researcher also spent more time identifying health facilities that had SFP commodities that could last for at least two reviews to enable data collection. A pilot study was conducted from 11 to 15 July 2016 while the actual data collection was conducted from 26 July to 3 November 2016.

3.4.2 Data collection

The researcher conducted the pilot study to pre-test the questionnaire in Mogotio. Questionnaires were pretested on existing SFP beneficiaries to measure validity and reliability of the questions and the questionnaire was edited after the exercise.

The CHWs attached to the sampled health facilities were recruited and trained to administer questionnaires to caregivers and to collect anthropometric data from the health facility records. Ability to speak the local language was a key consideration during recruitment. The CHWs were trained and standardised to implement the protocol with regards to inclusion and exclusion criteria as well as to gain informed consent from primary caregivers to take part in the study. The standardisation process involved role plays to help all CHWs identify who should or should not be included in the study. They were also trained on a standardized way of collecting data,

including how to probe and collect verbal responses. CHWs were also trained on how to calibrate tools on a daily bases to avoid measurement bias.

Structured interviews were conducted by the researcher and the CHWs: paper-based standardised questionnaires were administered to caregivers to collect data on breastfeeding practices, availability of SFP food at health facility level, utilisation of SFP food at household level and the nutritional knowledge of caregivers. The questionnaires contained both open and closed questions and the CHWs were trained to follow the same probes and clarifications for each respondent (Addendum 5). Verbal responses of participants were recorded in a standardised way to allow easier analysis of the data collected.

Anthropometric measurements of the participants were taken on the day of data collection by the researcher and the CHWs and updated in the health facility register. Retrospective measurements as taken by health care workers during admission into the SFP were collected from the health facility registers and transferred to the researcher's data capture sheet (Addendum 6). The researcher had planned to collect retrospective measurements of up to five reviews, but due to shortage of SFP commodities at health facilities in the months preceding the study, there was low beneficiary turnout. Beneficiaries who had missed more than two reviews had been discharged from the programme as defaulters and readmitted a month before the study when supplies were replenished. For this reason, the researcher only collected anthropometric measurements of two reviews, those being measurements taken during admission and during data collection. In order to accurately determine the average length of stay of beneficiaries in the programme and discharge criteria, the data capture sheet also allowed capture of the data of beneficiaries who were discharged from the programme within the month before the study. The researcher partially participated in data collection but visited every health facility at least once before the exercise to identify health facilities that had SFP commodities and once to supervise the data collection process.

3.4.3 Measurement instruments

MUAC tapes, measuring to the nearest mm, were used to measure the MUAC of participants. (The procedure for measuring MUAC is set out in Addendum 1.) Height boards and stadiometers were used to measure length and height. Digital weighing scales (Seca®) were available at health facility level and were used to measure the weight of the participants. (Addendum 1 sets out the procedure used for measuring weight.) The measuring equipment was readily available at health facility level courtesy of UNICEF. The equipment was standardised and calibrated as follows:

Weighing scale:

- Weighing scales were placed on a level, hard floor surface or a wooden platform was placed under the scale.
- The weighing scale was set at zero and checked using standardised weights. Calibration was corrected if the error was greater than 0.2 kilograms (kg).

Height board / stadiometer:

- The height boards were checked with standardised rods and corrected if the error was greater than 2 mm.
- If height was measured with the measuring rod attached to the balance beam scale, no further set-up procedures were required if the scale had been placed properly for weighing. However, it was verified that the upper part of the measuring rod was straight

and vertical (i.e. not bent or curved). If the height was measured by stadiometer, the height rule was taped vertically to a hard, flat wall surface with the base at floor level. The floor surface next to the height rule had to be hard. If no such floor was available, a hard, wooden platform was placed under the base of the height rule. The height rule was checked with standardised rods and corrected if the error was greater than 2 mm.

3.5 DATA MANAGEMENT

3.5.1 Data quality control and entry

Data quality checks were done on the questionnaires and data capture sheets at the end of every day and cleaning done by the data collection team. Data cleaning involved identifying incomplete and irrelevant data and completing and/or deleting it without compromising accuracy. Data coding and entry into the Statistical Package for Social Sciences (SPSS) software was done by the researcher progressively, and errors and gaps in data collection discussed with the team to avoid a repetition. The researcher also did data cleaning after data entry.

3.5.2 Data analysis

Data analysis was done using SPSS and Emergency Nutrition Assessment (ENA) software. Analysis was done using descriptive statistics and results were presented in frequencies and measures of central tendency (means). Analysis of underweight (W/A) and acute malnutrition based on MUAC was done using ENA software. Height measurements were not used because the period between admission and data collection was not adequate to show a change in height status. Guidelines require that height measurements for children are taken every four weeks⁵⁴. This is discussed further in Chapters 5 and 6.

CHAPTER 4

4 ETHICS ISSUES AND LEGAL ASPECTS

Ethics approval to conduct the study was necessary because the target group was a vulnerable population (moderately malnourished underage children). Ethics approval was given by the Stellenbosch University Health Research Ethics Committee while the county government of Baringo gave a research permit for the study to be conducted at health facility level.

Informed consent was obtained in writing from caregivers of the SFP beneficiaries (Addendum 7). The informed consent was written in three languages: the native Kalenjin language, the national Swahili language and English. The area under coverage had different Kalenjin sub-tribes, including Pokot, Tugen and Gems. The translation of the written consent form was customised according to the locality. The participants were given copies of the signed consent form to take home.

In order to ensure confidentiality, names were not indicated on the questionnaire or on the data capture sheets. Instead, unique identification numbers were used. The researcher or CHWs also assured the participants of confidentiality prior to data collection. The participants were also informed of the purpose of the study.

CHAPTER 5

5 RESULTS

A total of 407 moderately malnourished children, who were enrolled in SFP in Baringo County, participated in the study. The results of the study are presented systematically according to the objectives. Results are presented in tables summarising the means, frequencies and percentage of occurrence of each variable.

5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

Of the participants, 16.5% (n = 67) were from Baringo Central and Marigat, 48.6% (n = 198) from East Pokot and 34.9% (n = 142) from Baringo North. About half (51.6%; n = 210) were female, 51.0% (n = 207) were 6 to 23 months old, and 49.0% (n = 200) were 24 to 59 months old (Table 3). Almost all caregivers (93.4%; n = 380) were female. The main sources of income for the caregivers were casual labour and sale of livestock and livestock products at 36.1% (n = 147) and 34.6% (n = 141), respectively. The majority of caregivers (60.7%; n = 247) had no formal education.

Table 3: Socio-demographic characteristics of children and caregivers

		Frequency N = 407	Percentage (%)
Sub-county	Baringo Central	67	16.5
	East Pokot	198	48.6
	Baringo North	142	34.9
Gender of caregiver	Female	380	93.4
	Male	27	6.6
Gender of child	Female	210	51.6
	Male	197	48.4
Age of child	6–23 months	207	51.0
	24–59 months	200	49.0
Caregiver's major source of income	Salary or wage	11	2.7
	Casual labour	147	36.1
	Sale of livestock and livestock products	141	34.6
	Sale of crops	94	23.1
	Depends on handouts	14	3.4
Caregiver's level of education	No formal education	247	60.7
	Primary school dropout	102	25.1
	Primary school	42	10.3
	Secondary school dropout	11	2.7
	Secondary school	3	0.7
	Tertiary education	2	0.5

5.2 AVAILABILITY AND DISTRIBUTION MODALITIES OF SFP FOOD COMMODITIES AT HEALTH FACILITY LEVEL

Just less than two-thirds of participants (62.7%; n = 255) received RUSF during the distribution that preceded the study. Almost all of them (92.5%; n = 236) received the recommended 14 sachets of 92 g each (Table 4). However, based on observation of the health facility registers and feedback from health care workers, there were frequent stock-outs of SFP commodities at health facility level.

Table 4: Distribution of RUSF at health facility level

	Total	< 14 sachets		14 sachets		> 14 sachets	
	N	n	%	n	%	n	%
Number of 92 g RUSF sachets received at the previous distribution	255	12	4.8	236	92.5	7	2.7

5.3 UTILISATION OF SFP FOOD (RUSF) AT HOUSEHOLD LEVEL

The RUSF received per child per food distribution day did not last for the recommended 14 days for 33.2% (n = 135) of the participants. Of these 135 participants, 57.1% (n = 77) used the RUSF within five to nine days (Table 5). The main reason given for rations running out before 14 days was sharing RUSF with non-SFP-registered household members (65.5%; n = 88) (Table 6). Almost all participants (90.4%; n = 368) consumed one 92 g sachet per day and 57.0% (n = 232) fed directly from the sachet. Most caregivers (86.5%; n = 352) received instructions from health workers on how to use RUSF at household level (Table 7).

Table 5: Number of days that RUSF lasted

	Total	Yes		No	
	N	n	%	n	%
RUSF received per distribution day lasted for the recommended 14 days	407	272	66.8	135	33.2
Number of days that RUSF lasted for participants whose RUSF lasted less than 14 days		n	%		
1–4 days	135	18	13.3		
5–9 days	135	77	57.1		
10–13 days	135	40	29.6		

Table 6: Reasons why ration ran out before 14 days

	Total	Yes		No	
	N	n	%	n	%
Received less than entitled to	135	10	7.4	125	92.6
Shared with non-SFP-registered household members	135	88	65.5	47	34.8
Shared with non-household members (neighbours and extended family)	135	23	17.0	112	83.3
Losses in the home	135	14	10.4	121	89.9

Table 7: Consumption of RUSF at household level

	Total	Yes		No	
	N	n	%	n	%
One 92 g sachet consumed per child per day	407	368	90.4	39	9.6
More than one 92 g sachet consumed per child per day	407	39	9.6	368	90.4
RUSF fed directly from sachet	407	232	57.0	175	43.0
RUSF mixed with food	407	148	36.4	259	63.6
RUSF scooped with finger	407	27	6.6	380	93.4
Instructed on utilisation of RUSF at household level	407	352	86.5	55	13.5

5.4 NUTRITIONAL COUNSELLING AND APPLICATION OF KNOWLEDGE AT HOUSEHOLD LEVEL

5.4.1 Nutritional counselling at health facility level

Most of the caregivers (81.8%; n = 333) received nutritional counselling at the time of their child's admission into the SFP. More than half of the caregivers who received nutritional counselling reported that they were encouraged to continue breastfeeding beyond 6 months together with appropriate complementary feeding (56.2%; n = 187) and were informed about a balanced diet (54.7%; n = 182) (Table 8).

Table 8: Content of nutritional counselling

	Total	Yes		No	
	N	n	%	n	%
Encouraged to continue breastfeeding beyond 6 months together with appropriate complementary feeding	333	187	56.2	146	43.8
Informed about balanced diet	333	182	54.7	151	45.3
Discouraged from withholding feeds during illness	333	40	12.0	293	88.0
Informed of intake of small, frequent enriched feeds	333	64	19.2	269	80.8
Encouraged to bring all their children below 5 years old to the nearest health facility for growth monitoring and vitamin A supplementation every 6 months	333	152	45.6	181	54.4

5.4.2 Application of nutritional knowledge in the household

When specifically asked regarding their application of nutritional knowledge about a third (36.9%; n = 123) of caregivers who received nutritional counselling responded that they had not been practicing what they had been taught. Of those, 65.0% (n = 80) cited inadequate food access and 49.6% (n = 61) cited limited access to health care services as the main reason for not applying nutritional advice at household level (Table 9).

Table 9: Reasons for not applying nutritional advice at household level

	Total	Yes		No	
	N	n	%	n	%
Cultural factors	123	41	33.3	82	66.7
Inadequate food access	123	80	65.0	43	35.0
Maternal illness/roles/career that hinder mother from breastfeeding	123	23	18.7	100	81.3
Limited access to health care services (long distances to health facilities, lack of health staff, lack of nutritional supplements etc.)	123	61	50.4	62	49.6

5.4.3 Caregiver knowledge on purpose of SFP

The majority of caregivers (77.6%; n = 316) responded that treatment of MAM was the main reason for their children's admission into the SFP. A fifth (19.4%; n = 79) of caregivers did not know why their children were admitted to the SFP and the remaining 2.9% (n = 12) gave other reasons. The majority of caregivers (62.2%; n = 253) responded that their children would be discharged from the programme if they recovered (Table 10).

Table 10: The caregivers' knowledge on the discharge criteria of the SFP

	Total	Yes		No	
	N	n	%	n	%
Beneficiary recovery (cured)	407	253	62.2	154	37.8
Prolonged non-attendance (defaulter)	407	28	6.9	379	93.1
Non-recovery	407	22	5.4	385	94.6
All of the above	407	30	7.4	377	92.6
Don't know	407	88	21.6	319	78.4

5.5 BREASTFEEDING PRACTICES FOR MODERATELY MALNOURISHED SFP BENEFICIARIES AGED 6 TO 23 MONTHS

More than half (68.6%; n = 279) of mothers introduced complementary feeds to their children at 6 months (Table 11). Almost all (94.7%) participants aged 6 to 23 months were breastfed even after introduction of complementary feeds. More than half (53.0%) of the mothers intended to continue breastfeeding their children up to their next pregnancy. More than half (53.3%; n = 217) of participants were breastfed at least five times, 24 hours prior to the interview (Table 12).

Table 11: Breastfeeding practices

	Total	Yes		No	
	N	n	%	n	%
Introduced complementary feeds before the age of 6 months	407	128	31.4	279	68.6
Introduced complementary feeds at the age of 6 months	407	279	68.6	128	31.4
Intention to continue breastfeeding beyond introduction of complementary feeds if child is between 6 and 23 months old	207	196	94.7	11	5.3
Child breastfed the previous day	407	228	56.0	179	44
Intention to continue breastfeeding up to 24 months old	196	59	30.1	137	69.9
Intention to continue breastfeeding on demand regardless of age	196	30	15.3	166	84.7
Intention to continue breastfeeding until next pregnancy	196	103	52.6	93	47.4
Intention to continue breastfeeding for other reasons	196	4	2.0	192	98

Table 12: Frequency of breastfeeding

	Total	Yes	
	N	n	%
Breastfed less than 5 times per day	407	190	46.7
Breastfed at least 5 times per day	407	217	53.3

5.5.1 Complementary feeding practices

Almost all children (95.8%; n = 390) were fed on grains (maize, millet, sorghum, wheat) while 62.4% (n = 254) were fed on beta-carotene rich vegetables (Table 13). Consumption of pulses and fresh meat was at 49.9% and 37.1% respectively. A majority of participants (77.1%) were also fed on milk and milk products.

Table 13: 24-hour food-consumption recall

	Total	Yes		No	
	N	n	%	n	%
Grains (maize, millet, sorghum, wheat)	407	390	95.8	17	4.2
Roots and tubers (potatoes, yams, cassava)	407	83	20.4	324	79.6
Beta-carotene-rich vegetable (carrots, pumpkin, dark green vegetables)	407	254	62.4	153	37.6
Other vegetables (cabbages, lettuces)	407	90	22.1	317	77.9
Beta-carotene-rich fruits (mangoes, pawpaw)	407	78	19.2	329	80.8
Other fruits (bananas, watermelon, orange)	407	107	26.3	300	73.7
Pulses (beans, green grams, lentils, cowpeas, pigeon peas and nuts)	407	203	49.9	204	50.1
Fresh meat	407	151	37.1	256	62.9
Eggs	407	122	30.0	285	70.0
Milk, cheese, yogurt, sour milk	407	314	77.1	93	22.9
Fats, oil, sweets	407	229	56.3	178	43.7

5.6 CHANGE IN ANTHROPOMETRIC STATUS OF MODERATELY MALNOURISHED CHILDREN AGED 6 TO 59 MONTHS

5.6.1 Weight status

A total of 236 (58.0%) children were underweight for their age during admission, 46.4% (n = 189) of whom were severely underweight (< -3 z-score). More than half (53.3%; n = 105) of the sampled boys were severely underweight (Table 14). The percentage total underweight cases decreased to 53.3% (n = 217) by the second visit, and the percentage severely underweight boys to 48.2% (n = 95).

Table 14: Prevalence of underweight based on weight-for-age z-scores by sex

	Total		Boys		Girls	
Total sample	407		197		210	
	N	%	n	%	n	%
Admission (Visit 1)						
Prevalence of underweight (< -2 z-score)	236	58.0	124	62.9	112	53.3
Prevalence of moderate underweight (< -2 z-score and ≥ -3 z-score)	47	11.5	19	9.6	28	13.3
Prevalence of severe underweight (< -3 z-score)	189	46.4	105	53.3	84	40.0
Visit 2						
Prevalence of underweight (< -2 z-score)	217	53.3	120	60.9	97	46.2
Prevalence of moderate underweight (< -2 z-score and ≥ -3 z-score)	49	12.0	25	12.7	24	11.4
Prevalence of severe underweight (< -3 z-score)	168	41.3	95	48.2	73	34.8

5.6.2 MUAC status

A total of 333 (81.8%) of children had acute malnutrition during admission, based on MUAC < 125 mm. More than three-quarters of the sampled boys and girls – 76.1% ($n = 150$) and 80% ($n = 168$), respectively – were admitted with MAM. The percentage of children with acute malnutrition decreased to 66.3% ($n = 270$) by the second visit (Table 15).

Table 15: Prevalence of acute malnutrition based on MUAC cut-offs by sex

	Total		Boys		Girls	
Total sample	407		197		210	
	N	%	n	%	n	%
Admission (Visit 1)						
Prevalence of global malnutrition (< 125 mm and/or oedema)	333	81.8	154	78.2	179	85.2
Prevalence of moderate malnutrition (< 125 mm and ≥ 115 mm, no oedema)	318	78.1	150	76.1	168	80.0
Prevalence of severe malnutrition (< 115 mm and/or oedema)	15	3.7	4	2	11	5.2
Visit 2						
Prevalence of global malnutrition (< 125 mm and/or oedema)	270	66.3	122	61.9	148	70.5
Prevalence of moderate malnutrition (< 125 mm and ≥ 115 mm, no oedema)	267	65.6	120	60.9	147	70.0
Prevalence of severe malnutrition (< 115 mm and/or oedema)	3	0.7	2	1.0	1	0.5

5.6.3 Height measurements

The researcher only managed to collect retrospective height measurements screened by health workers during admission. Guidelines require that in order to detect a change in height status, height measurements for children should be taken every four weeks⁵⁴. Due to a lack of SFP commodities, beneficiary turnout was low and irregular, which limited collection of the measurements in the months preceding the study. Due to a lack of consistent and adequate data, it was not possible to generate a trend of height measurements or to compare W/H prevalence for two reviews (admission data and data collected by the researcher two weeks after admission).

5.7 LENGTH OF STAY OF BENEFICIARIES IN THE PROGRAMME

A total of 172 beneficiaries from the sampled health facilities were discharged from the SFP a month before the study. More than half of the cases (57.0%; $n = 98$) stayed in the programme longer than the recommended maximum length of stay of 84 days; the highest percentage (40.8%; $n = 40$) of these were from East Pokot County. Only 14% ($n = 24$) of the discharged cases stayed in the programme for the acceptable 56 to 84 days. The highest percentage (61.4%; $n = 81$) of beneficiaries who stayed in the programme longer than 84 days were aged 24 to 56 months, the majority of whom were female (62%; $n = 61$) (Table 16). Most of beneficiaries (74.4%; $n = 128$) were discharged from the programme as cured, and 81.6% ($n = 80$) stayed in

the programme longer than 84 days. Less than a quarter (23.2%; n = 40) of the discharged beneficiaries defaulted from the programme (Table 17).

Table 16: Length of stay for discharged beneficiaries

	Total	< 56 days		56–84 days		> 84 days	
	N	n	%	n	%	n	%
Total discharge cases	172	50	29.1	24	14	98	57
Discharge cases per sub-county							
East Pokot	69	19	38.0	10	41.7	40	40.8
Baringo Central	48	17	34.0	7	29.2	24	24.5
Baringo North	55	14	28.0	7	29.2	34	34.7
Gender distribution of discharge cases							
Female	102	35	70	6	25	61	62
Male	70	15	30	18	75	37	38
Age group of child (months)							
6–23	40	20	50	3	7.5	17	42.5
24–56	132	30	22.7	21	15.9	81	61.4

Table 17: Discharge criteria

	Total	Cured		Defaulter		Not recovered		Transfer to OTP	
	N	n	%	n	%	n	%	n	%
Discharge criteria	172	128	74.4	40	23.2	2	1.2	2	1.2
Length of stay									
< 56 days	50	34	68.0	14	28.0	0	0.0	2	4.0
56–84 days	24	14	58.4	10	41.7	0	0.0	0	0.0
> 84 days	98	80	81.6	16	23.3	2	2.0	0	0.0

CHAPTER 6

6 DISCUSSION

6.1 INTERPRETATION OF RESULTS

A proposed sample size of 496 participants was calculated for the purpose of this study, using the formula in Table 2. Due to many challenges this proposed sample size was not obtained, and only 407 moderately malnourished children participated in the study. At the time of data collection, health facilities within the area experienced shortage of SFP supplies leading to low beneficiary turnout. This limited the researcher from achieving the proposed sample size and also increased the data collection period from the anticipated three weeks to three and a half months (14 weeks). The researcher spent more time reaching the targeted number of participants and identifying sampled health facilities that had supplies that would last for at least two reviews to support data collection.

Poor nutritional status of children is affected by multiple environmental and socio-economic factors, including low household income and maternal education level⁵⁵. A study conducted in rural areas of Sudan on the influence of socio-economic aspects on food consumption patterns among children under five years old revealed that low parental education led to poor food choices, leading to high prevalence of nutritional anaemia in addition to the prevalence of wasting. The study also revealed that poverty and insufficient income for the households resulted in lack of food diversification, which was one of the main causes of nutritional anemia⁵⁶. This study has similar findings, as more than 60% of caregivers had no formal education and only 10.3% had completed primary school education. This may have negatively impacted on feeding practices at household level as almost a third of caregivers introduced complementary feeds before the age of six months and mainly fed children energy-dense foods (maize, millet, sorghum, wheat). The main sources of income of caregivers who participated in the study were casual labour and the sale of livestock and livestock products. The two income sources are highly dynamic depending on seasonality which may lead to poor purchasing power during lean seasons. This may have impacted negatively on the performance of the SFP as majority of caregivers attributed poor application of knowledge acquired during nutritional counselling to inadequate food access.

This study found that there were frequent stock-outs of SFP commodities at health facilities in Baringo County. A related semi-quantitative evaluation of access and coverage survey that was conducted in Baringo County in 2015 revealed that stock-outs of SFP commodities was common in the County and this discouraged caregivers from adhering to programme revisits⁵⁷. Another study consisting of a retrospective analysis of 62 SFPs implemented between 2002 and 2005 in Asia, Central America and Africa revealed that one of the events that was adversely affecting implementation of the programme was breaks in the pipeline of SFP supplies⁵⁸. Frequent stock-outs of SFP commodities result in high default rates, slow recovery rates and relapses thus limiting the programme from achieving its objectives.

Whenever stocks were available, distributions of SFP supplies were conducted as per the IMAM guidelines. Almost all beneficiaries received the appropriate fortnightly ration of 14 (92 g) RUSF sachets per distribution. However, the ration did not last for the recommended two weeks for a

third of the beneficiaries, in spite of majority of caregivers receiving instructions on utilisation of the commodity. This was mainly due to sharing SFP supplies with non-SFP-registered household members. A study conducted to critically analyse SFPs around the world revealed that about 42% of SFP food that was given to pregnant women was shared with other household members. The study also found that sharing was mainly dependent on the suitability of the food for consumption by all members of the household.⁵⁹ Sharing, together with low stock levels, could compromise the success of the SFP. According to the IMAM guidelines, sharing of SFP supplies lead to prolonged length of stay in the programme and failure to recover⁴⁴. Only about half of the children were fed the paste directly from the sachet as instructed. A large proportion of caregivers opted to mix the paste with food, which not only increased the chances of contamination through excessive handling, but also increased the chances of wastage through leftover food⁶⁰. This study found that nutrition education on utilisation of RUSF did not lead to the required behaviour as per SFP guidelines.

The majority of caregivers received nutritional counselling at the time of their children's admission into the SFP. Information given focused on the admission and discharge criteria of the SFP, and on infant and young child feeding practices. Although caregivers had received counselling, various factors limited adoption at household level, including inadequate food access and cultural factors. It is imperative that caregivers receive adequate information on the causes of their child's malnutrition and how to avoid relapse⁴⁴. This study found that majority of caregivers were aware that treatment of MAM was the main reason that their children were admitted into SFP and that they would be discharged once recovered.

Exclusive breastfeeding confers several benefits on the infant; chief among these is the protective effect against infant gastrointestinal infections⁶¹. A study conducted on the protective effect of breastfeeding against infection in Dundee revealed that babies who were exclusively breastfed for 13 weeks or more had significantly less gastrointestinal illness than those who were bottle-fed with artificial feeds from birth⁶². The nutrient needs of full-term, normal birthweight infants typically can be met by human milk alone for the first six months if the mother is well nourished⁶¹. In this study, exclusive breastfeeding for the recommended six months was widely practiced for the children enrolled in the SFP. However, children who were introduced to complementary feeds earlier than the recommended age risked having gastrointestinal infections which could further deteriorate their nutritional status⁶¹. Breastfeeding should continue even after introduction of complementary feeds as it is a key source of energy and essential fatty acids⁶¹. This study found that breastfeeding was well practiced as almost all children aged 6 to 23 months were breastfed even after introduction of complementary feeds.

Complementary foods are added to the diet of the child at six complete months in order to provide extra energy and nutrients that breast milk no longer supplies in sufficient amounts to sustain normal growth, optimal health and development⁶³. Food access determined the type of complementary food that was fed to a child. Almost all participants were fed carbohydrate-rich grains 24 hours before the study. It is important to note that beta-carotene-rich vegetables were fed to more than half of the children. A study that was conducted on consumption of vitamin A by breastfeeding children in rural Kenya revealed that the risk of vitamin A deficiency in breastfed infants older than six months was high because the majority of them did not consume foods high in vitamin A content three times weekly mainly due to household food insecurity⁶⁴. The current study also found that animal proteins were less commonly consumed. Proteins are

required for the rapid growth and development of young children. Animal foods are superior to plant foods as they deliver all essential amino acids needed to make proteins for growth and development. Inadequate intake of proteins can lead to kwashiorkor, among other symptoms such as growth failure, loss of muscle mass, decreased immunity, weakening of the heart and respiratory system and death⁶⁵.

The percentage of children who have low W/A (underweight) or MUAC < 125 mm can reflect wasting, stunting or both²⁷. Whenever there was a consistent supply of SFP commodities, the anthropometric status of beneficiaries would improve, as noted in the reduction in prevalence of underweight and acute malnutrition based on MUAC over a period of two weeks. Although W/H is a better indicator of the level of acute malnutrition, frequent stock-outs of SFP food limited collection of height measurements. Design of future studies and evaluations should ensure consistent supply of SFP commodities and should be conducted over a longer period of time to ensure sensitivity to change in height measurements.

More than half of the cases that were discharged as cured a month before the study, stayed in the programme longer than the recommended 84 days. The guidelines require that beneficiaries who stay in the programme longer than 84 days are discharged as non-recovered but referred for further medical check-ups and followed up by the CHW regarding the possible causes of non-recovery⁴². According to the findings of this study, discharge criteria were not adhered to and hence health facility data on recovery rate may not be reliable to inform stakeholders on the performance of the programme.

Supplementation of household diet through food intervention programmes plays a positive role in alleviating malnutrition. A study conducted in 12 villages in Niger reported that short-term supplementation of non-malnourished children with RUTF reduced the decline in W/H as well as the incidence of wasting and severe wasting over eight months⁵⁰.

6.2 LIMITATIONS OF THE STUDY

At the time of data collection, health facilities within the area experienced shortages of SFP supplies, which caused a much longer recruitment period than was originally planned for. This also contributed to low and irregular beneficiary turnout. The W/H measurements would have been a better indicator of the impact of the programme on nutritional status but due to a shortage of SFP supplies at the health facilities, there was high beneficiary absenteeism. For this reason, the height data that was collected were not adequate to establish a trend in nutritional status or to compare W/H indices. The researcher opted to compare change in W/A as well as prevalence of acute malnutrition based on MUAC between two consecutive follow-up visits.

Limited financial resources were a major constraint of the study. The researcher was unable to follow beneficiaries from the point of admission to discharge, due to limited funding. As a result, the researcher utilised secondary data from health facility records to determine the discharge criteria and length of stay of beneficiaries in the programme.

CHAPTER 7

7 CONCLUSION AND RECOMMENDATIONS

The evaluation of the SFP aimed at moderately malnourished children aged 6 to 59 months in Baringo County provided information on the implementation status of the programme and gave insight into the factors that limited the success of the programme.

7.1 AVAILABILITY AND DISTRIBUTION MODALITIES OF SFP FOOD COMMODITIES AT HEALTH FACILITIES

The lack of SFP commodities at health facilities was a key factor limiting the success of the programme. This led to slow recovery of the beneficiaries due to the poor sustainability of the supplementary diet. The programme stakeholders should ensure a healthy pipeline of SFP commodities by identifying sustainable solutions to challenges leading to a commodities shortage at health facility level. This can be achieved by first identifying the reasons for the shortage.

7.2 UTILISATION OF SFP FOOD (RUSF) AT HOUSEHOLD LEVEL

The success of the programme is not only dependent on adherence to guidelines, but also on a collaborative effort by households to alleviate malnutrition. Although beneficiaries were well informed on the utilisation of SFP commodities, practices such as sharing SFP commodities at household level and mixing RUSF with food were common. Programme stakeholders should consider linking SFP beneficiaries to existing food-assistance programmes that target the whole household to minimise sharing of SFP commodities. A long-lasting solution would be to improve food access at household level, with particular focus on nutrition-sensitive agriculture.

7.3 NUTRITIONAL COUNSELLING, KNOWLEDGE AND FEEDING PRACTICES

Nutritional counselling of caregivers at health facility level was done according to the IMAM guidelines, with an emphasis on infant and young child feeding practices. However, in practice, children were mainly fed high-carbohydrates diets with fair incorporation of protein-rich and vitamin A-rich foods. In Baringo County, food and nutrition security is largely determined by rainfall performance, as well as conflicts and insecurity. Crop failure in the irrigated and mixed farming zones is common due to erratic rains which affects food availability at household level. Conflicts in the County lead to market disruptions and closures, hence affecting food access⁶⁶. Inadequate food availability and access could be the reason why nutritional advice could only be applied to a limited extent at household level. A multi-sectorial approach that integrates therapeutic nutrition with social services such as hunger safety nets would ensure improved food availability and access at household level. Furthermore, counselling should aim at skills development to enhance behavioural change.

7.4 BREASTFEEDING PRACTICES FOR MODERATELY MALNOURISHED SFP BENEFICIARIES AGED 6 TO 23 MONTHS

Optimal breastfeeding practices were reported by the majority of mothers as they indicated that they breastfed exclusively for six months and intended to continue breastfeeding even after introduction of complementary foods. However, the early introduction of complementary foods (earlier than six months) was noted among mothers. Even though the programme targets children above six months, there is a need for antenatal and post-natal nutritional education of mothers on

good breastfeeding practices. The majority of mothers intended to continue breastfeeding, but some stopped along the way. Barriers to continue breastfeeding should be identified as this could help in developing effective health-promotion strategies to address the problem.

7.5 EFFECT OF SFP ON ANTHROPOMETRIC MEASUREMENTS OF MODERATELY MALNOURISHED CHILDREN AGED 6 TO 59 MONTHS

The programme had a positive effect on the nutritional status of beneficiaries, as noted in the reduction in prevalence of underweight and acute malnutrition, based on MUAC, two weeks after admission into the programme. This is an indication that with a regular supply of supplements and integration with other health care services, the programme has the potential to meet its objective. It is recommended that future longitudinal studies should include W/H measurements in order to measure the effect of SFP on both acute and chronic malnutrition.

7.6 LENGTH OF STAY OF BENEFICIARIES IN THE PROGRAMME

There was prolonged length of stay in the programme due to the sharing of SFP supplies at household level and inadequate supply of SFP commodities at health facility level. Discharge criteria were not adhered to and beneficiaries who stayed in the programme longer than the recommended 84 days were discharged as cured instead of non-recovered. Refresher training targeting health workers in the County should be done on all aspects of the implementation of the programme.

Prospective studies that track beneficiaries from admission to discharge should also be conducted when there is an adequate supply of SFP commodities at health facility level to establish the impact of the programme on nutritional status and recovery rates. The reasons for the inadequate supply of commodities should be identified and addressed. Studies should also be conducted to gauge the cultural factors impeding the success of the programme and how they should be countered.

The SFP also targets pregnant and lactating women with MUAC below 21cm⁴⁴. Future studies should assess the impact of the programme on the nutritional status of pregnant and lactating women. Nutrition sensitise programming is a more sustainable measure to combat malnutrition. This may include promoting production, preservation and marketing of drought tolerant nutrient dense crops. Nutrition and health promotion strategies to combat malnutrition should target various sectors, such as health, education, agriculture, food legislation and social development, to ensure that the causes of malnutrition are addressed.

REFERENCES

1. FAO; IFAD; WFP. The State of Food Insecurity in the World 2015. Meeting the 2015 international hunger targets: taking stock of uneven progress. [Internet]. Rome; 2015 [cited 2018 Oct 18]. Available from: www.fao.org/publications
2. Food and Organization (FAO). Nutrition country profiles: Republic of Kenya [Internet]. 2010 [cited 2017 Jan 27]. Available from: http://www.fao.org/ag/AGN/nutrition/KEN_en.stm
3. World Food Programme (WFP). WFP Nutrition Policy [Internet]. 2012 [cited 2017 Apr 5]. Available from: http://documents.wfp.org/stellent/groups/public/documents/eb/wfpdoc061668.pdf?_ga=1.44634532.1617740762.1460555445
4. Kenya National Bureau of Statistics, ICF Macro. Kenya Demographic and Health Survey 2014 [Internet]. Nairobi; 2015 [cited 2017 Jan 25]. Available from: <https://dhsprogram.com/pubs/pdf/fr308/fr308.pdf>
5. World Vision Kenya (WVK). SMART nutrition survey final report. Nairobi; 2013.
6. Save the Children USA. Acute Malnutrition Summary Sheet [Internet]. [cited 2017 May 9]. Available from: <http://www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74a%7D/Acute-Malnutrition-Summary-Sheet.pdf>
7. World Vision Kenya (WVK). East Pokot Small Scale Smart Nutrition Survey. Nairobi; 2014.
8. World Food Programme (WFP). Minimum Monitoring Requirements. Rome: WFP; 2014.
9. Fortune of Africa. Background and Geography - Kenya [Internet]. 2016 [cited 2017 Jan 25]. Available from: <http://fortuneofafrica.com/kenya/geography-and-climate/>
10. Kenya National Bureau of Statistics. Kenya 2009 Population and Housing Census Analytical Report on Population Dynamics. Vol. XV. Nairobi: KNBS; 2012.
11. The World Bank. Kenya: A Bigger, Better Economy [Internet]. 2014 [cited 2017 Jan 25]. Available from: <http://www.worldbank.org/en/news/feature/2014/09/30/kenya-a-bigger-better-economy>
12. United Nations Development Programme (UNDP). Briefing note for countries on the 2016 Human Development Report [Internet]. Newyork: UNDP; 2015 [cited 2017 Jan 24]. Available from: http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/KEN.pdf
13. International Fund for Agriculture Development (IFAD). Investing in rural people in Kenya [Internet]. Rome; 2015 [cited 2017 Jan 25]. Available from: <https://www.ifad.org/documents/10180/bf67bad8-a182-4c79-a919-433af31eba02>
14. Mcsweeney C, New M, Lizcano G. UNDP Climate Change Country Profiles [Internet]. 2015 [cited 2017 Jan 25]. Available from: <http://country-profiles.geog.ox.ac.uk>
15. Matheka J, Kimathi G. Baringo County 2014 short rains food security assessment report; Food Security Assessment Report [Internet]. 2015 [cited 2017 Jan 25]. Available from:

http://www.ndma.go.ke/index.php/component/jdownloads/send/43-2015/647-baringo?option=com_jdownloads

16. National Drought Management Authority (NDMA). Drought monitoring and early warning bulletin. [Internet]. 2014 [cited 2017 Jan 25]. Available from: <http://www.ndma.go.ke/index.php/component/jdownloads/send/8-baringo/890-baringo-november-2014>
17. Ministry of the State for the development of Northern Kenya and Other Arid lands. Arid lands resource management project II: Drought Monitoring Bulletin [Internet]. Nairobi; 2009 [cited 2017 Jan 25]. Available from: http://reliefweb.int/sites/reliefweb.int/files/resources/56D48B8DD67045C6432576A500362986-Full_Report.pdf
18. United Nations. Hunger and food security - Sustainable Development goals [Internet]. [cited 2017 Jan 27]. Available from: <http://www.un.org/sustainabledevelopment/hunger/>
19. Food and Agriculture Organization (FAO). Kenya: FAO in Emergencies [Internet]. 2012 [cited 2017 Jan 27]. Available from: <http://www.fao.org/emergencies/countries/detail/en/c/151674/>
20. World Food Programme (WFP). Kenya Food Security and Outcome Monitoring report (FSOM), May 2014 [Internet]. Nairobi; 2014 [cited 2018 Aug 27]. Available from: <https://documents.wfp.org/stellent/groups/public/documents/ena/wfp272257.pdf?iframe>
21. World Food Programme (WFP). Kenya Food Security and Outcome Monitoring (FSOM) December 2013 [Internet]. Nairobi; 2013 [cited 2017 Jan 27]. Available from: <http://www.wfp.org/content/kenya-food-security-and-outcome-monitoring-2013>
22. World Food Programme (WFP). Kenya Food Security and Outcome Monitoring (FSOM), December 2014 [Internet]. Nairobi; [cited 2018 Aug 27]. Available from: <https://documents.wfp.org/stellent/groups/public/documents/ena/wfp272415.pdf?iframe>
23. Kimithi M. Baringo County 2013/2014 short rains food security assessment. Nairobi: Kenya Food Security Steering Group; 2014.
24. Mathooko J, Mutua S, Csg T, County B. Baringo County 2014 long rains food security assessment report. Nairobi: Kenya Food Security Steering Group; 2014.
25. World Health Organization (WHO). Micronutrients [Internet]. WHO. World Health Organization; 2015 [cited 2017 Jan 27]. Available from: <http://www.who.int/nutrition/topics/micronutrients/en/>
26. Srikanth VS, Mangala S, Subrahmanyam G. Improvement of Protein Energy Malnutrition by Nutritional Intervention with Moringa Oleifera among Anganwadi Children in Rural Area in Bangalore, India [Internet]. Vol. 2, International Journal of Scientific Study. 2014 [cited 2018 Oct 23]. Available from: https://www.ijss-sn.com/uploads/2/0/1/5/20153321/ijss_apr-08.pdf
27. World Health Organization (WHO). Nutrition Landscape Information System (NLIS) Country Profile Indicators Interpretation Guide [Internet]. [cited 2017 Jun 12]. Available from: http://www.who.int/nutrition/nlis_interpretation_guide.pdf

28. World Health Organization (WHO). Global nutrition targets 2025: Wasting policy brief [Internet]. 2015 [cited 2017 Jan 31]. Available from: http://apps.who.int/iris/bitstream/10665/149023/1/WHO_NMH_NHD_14.8_eng.pdf?ua=1
29. WHO; UNICEF. WHO child growth standards and the identification of severe acute malnutrition in infants and children [Internet]. [cited 2018 Oct 17]. Available from: www.who.int/childgrowth/standards
30. World Food Programme (WFP). Nutrition at the World Food Programme; Programming for Nutrition-Specific Interventions [Internet]. 1st ed. Rome; 2012. Available from: www.wfp.org/nutrition
31. World Health Organization (WHO). Complementary Feeding of Young Children in Developing Countries [Internet]. 1998 [cited 2017 Jan 25]. Available from: http://www.who.int/nutrition/publications/infantfeeding/cf_dev_countries_chap1.pdf
32. United Nations Children's Fund (UNICEF). The State of the World's Children 1998 [Internet]. [cited 2018 Aug 27]. Available from: <https://www.unicef.org/sowc98/silent4.htm>
33. United Nations Children's Fund; World Health Organization; The World Bank. UNICEF WHO-World Bank Joint Child Malnutrition Estimates [Internet]. New York; 2012 [cited 2018 Oct 17]. Available from: http://www.who.int/about/licensing/copyright_form/en/index.html
34. De Onis M, Blössner M, Borghi E, Morris R. Methodology for estimating regional and global trends of child malnutrition. *Int J Epidemiol* [Internet]. 2004 [cited 2017 Jan 31]; Available from: <http://ije.oxfordjournals.org/content/33/6/1260.short>
35. United Nations Children's Fund (UNICEF). Tracking progress on child and maternal nutrition: a survival and development priority [Internet]. New York: UNICEF; 2009 [cited 2017 Jan 31]. Available from: https://www.unicef.org/publications/index_51656.html
36. United Nations Children's Fund (UNICEF). Statistics | Kenya [Internet]. 2013 [cited 2017 Jan 31]. Available from: https://www.unicef.org/infobycountry/kenya_statistics.html
37. De Onis M, Brown D, Blossner M, Borghi E. Levels and trends in child malnutrition. UNICEF-WHO-The World Bank joint child malnutrition estimates. 2012 [cited 2017 Jan 31]; Available from: <http://www.popline.org/node/552837>
38. Ministry of Health (MOH). Maternal, Infant and Young Child Nutrition: National Operational Guidelines for Health Workers [Internet]. 1st ed. James Njiru, Evelyn Matiri, editors. Nairobi: Division of Nutrition; Ministry of Health; 2013 [cited 2017 Jan 25]. Available from: http://pdf.usaid.gov/pdf_docs/PA00JTGD.pdf
39. United States Agency for International Development (USAID). Draft trainers manual for implementing high impact essential nutrition action in the context of MCH/FP and HIV [Internet]. 2015 [cited 2017 Jan 25]. Available from: http://www.basics.org/reports/trainers_manual_for_ena_mfsg.pdf
40. United Nations High Commission for Refugees (UNHCR)/World Food Programme (WFP). Guidelines for selective feeding programmes in emergency situations [Internet]. UNHCR;

- WFP; 1999 [cited 2017 Jan 24]. Available from:
http://www.unscn.org/layout/modules/resources/files/UNHCR_WFP_Guidelines_for_selective_feeding_programmes_in_eme.pdf
41. IASC Global Nutrition Cluster and Standing Committee on Nutrition Task Force on Assessment Monitoring and Evaluation. Fact sheet on the implementation of 2006 WHO Child Growth Standards for emergency nutrition programmes for children aged 6-59 months [Internet]. Public Health Nutrition. Geneva: UNHCR; 2009 [cited 2018 May 8]. p. 1–8. Available from: <http://www.unhcr.org/uk/protection/health/4b751a989/fact-sheet-implementation-2006-child-growth-standards-emergency-nutrition.html>
 42. World Food Programme (WFP). Target Supplementary Feeding Programme Guidelines [Internet]. 2014 [cited 2017 Mar 16]. Available from:
https://www.humanitarianresponse.info/system/files/documents/files/TSFP_Guideline_for_CPs_Final.pdf
 43. The Sphere Project. Sphere Handbook: Minimum Standards in Food Security and nutrition. [cited 2017 Jun 19]; Available from:
<http://www.spherehandbook.org/content/pages/en/7.minimum-standards-in-food-security-and-nutrition.pdf>
 44. Ministry of Medical Services (MOMS); Ministry of Public Health and Sanitation (MOPHS). National Guideline for Integrated Management of Acute Malnutrition. Nairobi: MOMS/MOPHS; 2009.
 45. World Food Programme (WFP). Food and Nutrition Handbook. Callanan A, editor. Rome: WFP; 2009.
 46. World Health Organization (WHO). Technical Note: Supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age [Internet]. Geneva: World Health Organization; 2012 [cited 2017 Jan 24]. Available from:
http://apps.who.int/iris/bitstream/10665/75836/1/9789241504423_eng.pdf
 47. World Food Programme. Specialized Nutritious Foods Sheet Programme: Treating Moderate Acute Malnutrition (MAM) [Internet]. World Food Programme; [cited 2017 Feb 6]. Available from:
<http://documents.wfp.org/stellent/groups/public/documents/communications/wfp255508.pdf>
 48. World Health Organization (WHO). Guiding principles for feeding infants and young children during emergencies [Internet]. Geneva: WHO; 2004 [cited 2017 Feb 3]. Available from:
http://www.searo.who.int/entity/emergencies/documents/guiding_principles_for_feeding_infants_and_young_children_during_emergencies.pdf
 49. LaGrone L, Trehan I, Meuli G, Wang R. A novel fortified blended flour, corn-soy blend “plus-plus,” is not inferior to lipid-based ready-to-use supplementary foods for the treatment of moderate acute malnutrition in Malawian children. *Am J Clin Nutr* [Internet]. 2012 [cited 2017 Feb 3];95(1):212–9. Available from:
<http://ajcn.nutrition.org/content/95/1/212.short>

50. Isanaka S, Nombela N, Djibo A, Poupard M. Effect of preventive supplementation with ready-to-use therapeutic food on the nutritional status, mortality, and morbidity of children aged 6 to 60 months in Niger: A cluster randomized trial. *JAMA* [Internet]. 2009 [cited 2017 Feb 3];301(3):277–85. Available from: <http://jamanetwork.com/journals/jama/fullarticle/183241>
51. Ministry of Health (MOH). Kenya Health Information System [Internet]. [cited 2017 Jan 25]. Available from: <https://hiskenya.org/dhis-web-commons/security/login.action;jsessionid=1CB611F22E153B539E8C4E2E13915954>
52. County Government of Baringo. Baringo County: First county integrated development plan 2013-2017 [Internet]. Kabarnet; 2013 [cited 2017 Feb 6]. Available from: http://baringo.go.ke/images/downloads/Budget_Documents/BARINGO_COUNTY_CIDP.pdf
53. Joubert G, Ehrlich R, Katzenellenbogen J, Abdool K S. *Epidemiology: a research manual for South Africa*. 2nd ed. Cape Town: Oxford University Press Southern Africa; 2007.
54. Ministry of Health - Health Information System. Module 8 Part 1 - Supplementary feeding programme [Internet]. [cited 2018 Jul 4]. Available from: <http://www.unhcr.org/461e53182.pdf>
55. Adnan N, Muniandy ND. The Relationship between Mothers' Educational Level and Feeding Practices among Children in Selected Kindergartens in Selangor, Malaysia: A Cross-sectional Study. *Asian J Clin Nutr* [Internet]. 2012 Feb 1 [cited 2018 Jan 8];4(2):39–52. Available from: <http://www.scialert.net/abstract/?doi=ajcn.2012.39.52>
56. Abdalla MA, Sulieman SA, El Tinay AH, Gader A, Khattab H. Socio-Economic Aspects Influencing Food Consumption Patterns Among Children under Age of Five in Rural Area of Sudan. *Pakistan J Nutr* [Internet]. 2009 [cited 2018 Jan 8];8(5):653–9. Available from: [http://41.67.20.41:8080/bitstream/handle/123456789/17750/Socio-Economic Aspects Influencing Food Consumption Patterns.pdf?sequence=1&isAllowed=y](http://41.67.20.41:8080/bitstream/handle/123456789/17750/Socio-Economic%20Aspects%20Influencing%20Food%20Consumption%20Patterns.pdf?sequence=1&isAllowed=y)
57. World Vision Kenya (WVK). SQUEAC REPORT For East Pokot, Marigat and Mogotio Sub-Counties, Baringo County, Kenya. [Internet]. 2015 [cited 2018 Jan 24]. Available from: <http://www.coverage-monitoring.org/wp-content/uploads/2016/02/SQUEAC-Report-East-Pokot-Marigat-and-Mogotio-sub-counties.pdf>
58. Navarro-Colorado C. A Retrospective Study of Emergency Supplementary Feeding Programmes [Internet]. 2007 [cited 2018 Jan 24]. Available from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.532.5698&rep=rep1&type=pdf>
59. Schilling PR. Supplementary feeding programs: a critical analysis. *Rev Saude Publica* [Internet]. 1990 Oct [cited 2018 Jan 9];24(5):412–9. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89101990000500010&lng=en&tlng=en
60. World Food Programme (WFP). Target supplementary feeding programme guidelines [Internet]. 2014 [cited 2017 Aug 18]. Available from: [https://www.humanitarianresponse.info/system/files/documents/files/TSFP Guideline for CPs_Final.pdf](https://www.humanitarianresponse.info/system/files/documents/files/TSFP%20Guideline%20for%20CPs_Final.pdf)

61. World Health Organization (WHO). Guiding principles for complementary feeding of the breastfed child. 2001 [cited 2017 Aug 7]; Available from: http://www.who.int/nutrition/publications/guiding_principles_compfeeding_breastfed.pdf
62. Howie P W, Forsyth J S, Ogston A K, Clark A, Florey C. Protective effect of breast feeding against infection. *Br Med J* [Internet]. 1990 [cited 2018 Jan 24];300:11–6. Available from: <http://www.bmj.com/content/bmj/300/6716/11.full.pdf>
63. Motee A, Jeewon R. Importance of Exclusive Breast Feeding and Complementary Feeding Among Infants. *Curr Res Nutr Food Sci*. 2014;2(2):56–72.
64. Ettyang, G; Oloo, A; Lichtenbelt, W; Saris W. Consumption of vitamin A by breastfeeding children in rural Kenya. Eldoret: Moi University; 2004.
65. Harvard School of Public Health. The nutrition source: Protein [Internet]. 2018 [cited 2018 May 8]. Available from: <https://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/protein/>
66. Muraguri, P; Ooko E. Baringo County 2016 short rains food security assessment report a joint report by the and County Steering Group (CGS), Baringo County and Kenya Food Security Steering Group (KFSSG) 1 [Internet]. 2017 [cited 2018 Jan 22]. Available from: [https://reliefweb.int/sites/reliefweb.int/files/resources/Baringo County SRA 2017.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/Baringo%20County%20SRA%202017.pdf)

ADDENDA

7.7 ADDENDUM 1: BASIC PROCEDURES OF IMPLEMENTING SFP

Step 1: Screen children 6 to 59 months for malnutrition. This involves taking anthropometric measurements (Weight, height/length and MUAC) and checking medical conditions and admission criteria to determine if patient is malnourished or not⁴⁸.

Screening	Procedure
Measure weight⁹	<ol style="list-style-type: none"> 1. Before weighing the child, take all his/her clothes off. 2. Place the weighing pants on the lower hook and zero the weighing scales (i.e. make sure the arrow is on 0.) 3. Place the child in the weighing pants/hammock, making sure the child is touching nothing. 4. Read the child's weight. The arrow must be steady and the weight/scale should be read at eye level. 5. Record weight (e.g. 4.3kg)
Measure height⁹	<p>length/ Procedure of Measuring the Length of a Child (<85cm)</p> <ol style="list-style-type: none"> 1. Place the measuring board on level ground in a well-lit place with room to manoeuvre, and lay the child in the middle of it. 2. The assistant holds the sides of the child's head, and positions the child so that the top of the head touches the "foot board". 3. The measurer positions and holds the child's knees and ankles in a straight line, then places the "cursor" or "slider" (the movable portion of the board) so that the feet are flat against it. 4. The child's arms must be by their side. 5. The child's feet should be at a 90° angle to the horizontal and the vertical (as if they were standing up straight). 6. The child's head must be perpendicular to the base of the base of the measuring board. This can be ensured by placing the child's head so that their line of sight is 90° to the base. 7. Use the mother to assist in controlling a restless child by requesting that she holds the child's head in place. 8. The measurer reads the length to the nearest 0.1 cm and announces it to an assistant.
Measure height⁹	<p>length/ Procedure of Measuring the Height of a Child (≥85cm)</p> <ol style="list-style-type: none"> 1. Place the measuring board upright on a level space in a location where there is room to maneuver. 2. Ensure that there is something solid, and at least the height of the board (e.g. a person or a wall), behind the measuring board. This is to prevent the board toppling

	<p>when pressure is placed on the child's legs.</p> <ol style="list-style-type: none"> 3. Remove the child's shoes and hat if they are wearing them. Stand the child in the middle of the measuring board. 4. The assistant should press on the child's ankles and knees against the board, ensuring the child's head, shoulders, buttocks, knees and heels touch the board. 5. The measurer positions the head at a 90° angle to the "cursor" / "slider". 6. The measurer reads the height to the nearest 0.1 cm and announces it to an assistant who confirms it aloud before recording it immediately.
Measure MUAC⁹	<p>Procedure of Measuring MUAC</p> <ol style="list-style-type: none"> 1. Ask the mother to remove clothing that may cover the child's left arm. 2. Calculate the midpoint of the child's left upper arm by first locating the tip of the child's shoulder with your fingertips. 3. Bend the child's elbow to make a right angle. Place the tape at zero, which is indicated by two arrows, on the tip of the shoulder and pull the tape straight down past the tip of the elbow. 4. Read the number at the tip of the elbow to the nearest centimeter. Divide this number by two to estimate the midpoint. 5. As an alternative, bend the tape up to the middle length to estimate the midpoint. A piece of string can also be used for this purpose. Either you or an assistant can mark the midpoint with a pen on the arm. 6. Straighten the child's arm and wrap the tape around the arm at midpoint. Make sure the numbers are right side up. Make sure the tape is flat around the skin 7. Inspect the tension of the tape on the child's arm. Make sure the tape has the proper tension) and is not too tight or too loose. Repeat any steps as necessary. 8. When the tape is in the correct position on the arm with the correct tension, read and call out the measurement to the nearest 0.1cm.

Step 2: Compare the height and weight measurements with the z-score tables to determine the nutritional status. If malnourished or at risk of being malnourished, admit child for supplementary feeding⁸

- i. Register child using registration books
- ii. Explain to mothers what this would mean (additional food ration that is meant for and/or the child only, follow-up to the health facility every 2 weeks)

Step 3: Give mother routine nutritional counseling (refer to Addendum 2)

Step 4: Distribute the food ration which should last for two weeks: These include a premixed ration of 3.5KG of fortified Blended Flours and 0.35litres of oil per beneficiary per 2 weeks. This translates to 250g FBF and 25g oil per person per day⁸

Step 5: When mother comes back for follow-up (after 2 weeks), Check weight, MUAC, Oedema and record in registration book⁸

Step 6: Exit child or mother from program when they reach the exit criteria⁸

7.8 ADDENDUM 2: KEY MESSAGES/ ACTION POINTS⁴⁴

Topic	Key messages/ action points
Optimal breastfeeding	<ul style="list-style-type: none"> • Timely initiation of breastfeeding (within one hour of delivery) and giving of colostrum. • Importance of continuing to breastfeed for at least two years. • Importance of ensuring proper hygiene in food preparation and feeding. • Give appropriate information to mothers to support exclusive and continued breastfeeding. • Children 0-6 months should be exclusively breastfed: No feeds (including water) other than breast milk only • Breastfeeding should be on demand (as long as the infant wants). • Encourage breastfeeding during illness. If child is not able to breast feed, encourage expression of breast milk and feed by cup.
Optimal complementary feeding	<ul style="list-style-type: none"> • Encourage continued breastfeeding beyond 6 months together with appropriate complementary feeding. • Explain body building, energy giving, and protective foods. • Body building foods responsible for building and repairing our body (e.g. Meat, beans, milk eggs). • Explain energy giving foods provide energy to our body to enable us to carry out daily activities like, working, thinking, running, playing etc (sorghum, maize, oil,). • Explain protective foods enable the body to protect against infection and fight diseases (e.g. Green vegetables, Mangoes, Carrots). • Encourage increased fluid intake, including breastfeeding, day and night for children with diarrhea or vomiting. • Discourage withholding of feeds during illness and instead encourage intake of small frequent enriched feeds daily or give an extra meal above child 's usual daily feeds. • Encourage mothers to bring all their children below 5 years old to the nearest health facility for growth monitoring monthly as well as for vitamin A supplementation every 6 months. • Feeding of the sick and or malnourished children • If the child is still breastfeeding, encouraged mother to continue.

	<ul style="list-style-type: none"> • The child at this stage requires: 1. High energy intake (150 -200 kCal/kg body weight) 2. Sufficient protein 4-5g/kg body weight/day 3. Micronutrients especially potassium, iron, zinc and vitamins • The feeds must be easy to eat and digest. • To achieve high energy intakes: 1. feed the child frequently, at least six times a day 2. Add oil, honey, margarine, butter, sugar 3. Use fat rich foods like groundnuts, avocado, undiluted buffalo milk and sheep's milk. • To achieve high protein intakes: Use milk, or locally available stable mixed with legumes, meat or fish
Maternal nutrition	<ul style="list-style-type: none"> • Take the weight (in kg) of all pregnant women and record it on the maternal clinic card. • Counsel mothers on appropriate diet for pregnant women using locally available foods. • Encourage consumption of a balanced diet rich in vitamins and minerals. • Emphasize on use of iodized salt. • Encourage mother to ensure that all children aged five years and below and pregnant women sleep under insecticide treated mosquito nets, for preventing anemia because malaria is often a major underlying factor. • Counsel mothers on diet during lactation emphasizing importance of extra food while lactating using list of locally affordable foods.
Vitamin A supplementation	<p><i>Children</i></p> <ul style="list-style-type: none"> • All children aged 6 to 59 months need a vitamin A capsule every 6 months. • Vitamin A supplementation is safe for children and protects them from diseases such as diarrhea, acute respiratory infections and also reduces deaths. • Children should be fed as often as possible with vitamin A rich foods (mangoes, green leafy vegetables, wild red and orange fruits, egg York, liver, milk, etc.) • Children sick with measles, certain eye problems, severe diarrhea or severe malnutrition should visit health centers because they may need additional Vitamin A according to the treatment schedule. <p><i>Mothers</i></p> <ul style="list-style-type: none"> • Give mothers a dose of 200,000 IU of vitamin A if baby is 8 weeks old or less. • Ensure that the capsule is swallowed on site.

	<ul style="list-style-type: none"> • Encourage the mother to consume a balanced diet using locally available foods and a variety of foods rich in vitamin A such as liver, eggs, oranges, yellow sweet potatoes, pumpkins, dark green leafy vegetables. • Record in register mother who have received high dose vitamin A supplementation. Also indicate in Child Card that mother has been supplemented with vitamin A.
Iron and folate	<p>Children</p> <ul style="list-style-type: none"> • Give one dose at 6 mg/kg of iron daily for 14 days. • Avoid iron in a child known to suffer from sickle cell anemia • Avoid folate until 2 weeks after child has completed the dose of sulfa based drugs <p>Mothers</p> <ul style="list-style-type: none"> • Give all pregnant women a standard dose of 200mg iron (Feso4) tablets three times a day + 5 mg folate once daily. • Promote use of anti-malarial interventions such as bed nets for preventing anemia because malaria is often a major underlying factor. • Provide advice on food items and medicines that should not be taken together with iron supplements since they may inhibit absorption such as milk, antacids, tea and coffee. • Treat anemia with treatment doses of iron for 3 months. • Refer severe cases of anemia to the nearest higher level of care if they are in the last month of pregnancy, have signs of respiratory distress or cardiac abnormalities such as edema. • Provide advice on a balanced diet and emphasize on consumption of iron rich foods such as liver, red meats, eggs, fish, whole-grain bread, legumes and iron fortified foods. • Promote consumption of vitamin C rich foods such as oranges, green vegetables, as they enhance the absorption of iron.
Hygiene and sanitation	<p>Store uncooked food in a safe dry place</p> <ul style="list-style-type: none"> • Protect food from insects, rodents and other animals • Avoid contact between raw food stuffs and cooked food • Keep areas where children are fed or play free from human and animal faeces • Keep all food preparation premises clean

	<ul style="list-style-type: none"> • Wash hands before preparing food for feeding children • Wash cooking utensils Wash fruits and vegetables • Use clean water Cook food thoroughly • Avoid storing cooked food, instead, prepare food often If cooked food is saved, keep it as cool as possible If previously food is to be eaten reheat it thoroughly before eating • Wash the child ' s hands before feeding • Use open feeding cups • Feed actively, that is supervise the child and continue offering food until the child has enough
De-worming	<ul style="list-style-type: none"> • Give 500mg mebendazole or 400mg albendazole as a single dose in clinic if the child is 2 years of age or older and if the child has not had any in the previous 6 months
Growth monitoring	<ul style="list-style-type: none"> • Children aged 0-2 years need to be weighed every month. Children 0-59 months need to be weighed often enough to determine if they are growing adequately. • When children come for weighing , also check for their immunization and vitamin A supplementation status • Children whose growths are faltering are at high risk and should be monitored closely by health facility staff.

7.9 ADDENDUM 3: LIST OF HEALTH FACILITIES IN BARINGO COUNTY⁵¹

Baringo Central and Marigat Sub – East Pokot Sub – County				Baringo North Sub – County		
Ward	Health facility	Division	Health facility	Division	Health facility	Health facility
1 Marigat	1. Marigat d h	1. Churo	1. Churo	1. Bartabwa	1. Atiar	
	2. Kimalel h/c		2. Amaya		2. Bartabwa	
			3. Lomuge			
	3. Sandai	2. Tangulbei	1. Kokwototo		3. Kalabata	
	4. Kampi ya samaki		2. Tangulbel		4. Kapturo	
	5. Lobo		3. Komolion		5. Moigutwo	
	6. Sabor	3. Kollowa	1. Barpello		6. Yatia	
2 Mukutani	7. Ilngarua		2. kollowa	2. Barwesa	1. Kapkiamo	
	1. Kiserian		3. Chepturu		2. Keturwo	
3 Mochongoi	2. Mukutani	4. Nginyang	1. Maron		3. Kuikui	
	1. Kapindasim		2. Chemolingot		4. Likwon	
	2. Lamaiwe		3. Kamrio		5. Barwesa	
	3. Muchongoi		4. Kositei	3. Kabartonjo	1. Kabartonjo	
4 Kabarnet	4. Ol arabel		5. Nginyang		2. Kasisit	
	1. Kabarnet d h	5. Mond	1. Chesirimion		3. Kipcherere	
	2. Kibingor disp		2. Loruk		4. Koroto	
	3. Kituro h/c		3. Riongo	4. Kipsaraman	1. Poi	
5 Salawa	4. Riwo disp	6. Ngoron	1. Kapunyang			
	1. Salawa h/c		2. Ngoron			
	2. Salawa phc					
	3. Kiboino disp					
6 Tenges	4. Chesongo disp					
	1. Bekibon disp					
7 Sacho	2. Mogorwa h/c					
	1. Kapkelelwa disp					
	2. Ochii disp					

3. Kipsacho

7.10 ADDENDUM 4 : NUMBER OF MODERATELY MALNOURISHED CHILDREN IN BARINGO COUNTY IN DECEMBER 2014⁵¹.

SFP Management of MAM					
Baringo County December 2014					
Data element	(Male 6-59 Months)	(Female 6-59 Months)	(> 5 years)	(Pregnant & Lactating mothers)	Total
Beneficiaries at beginning of month	944	981	7	943	2875
New admission cases	98	97	1	77	273
Old Admission relapses		2		1	3
Old admission return defaulters	5	11		8	24
Old admission transfer from other OTP/SC	11	11			22
Discharge Cured	35	37		20	92
Discharge Death					
Discharge Defaulters	5	2		8	15
Discharge Non Recovered	2			2	4
Transfer Out to OTP/SC					
Transfer to other SFP sites				2	2
Average Length of Stay in Days -Nutrition	190	232		120	542
Under GFD Programme					
Beneficiaries who Received CSB/Unimix				109	109
Beneficiaries who Received veg Oil				109	109
Beneficiaries who Received RUSF Sachet	119	77			196
					3086

7.12 ADDENDUM 5: QUESTIONNAIRE

QUESTIONNAIRE

Title of Research Study: Evaluation of the Supplementary Feeding programme targeted at moderately malnourished children aged 6 to 59 months in Baringo County Kenya.

Instructions

- Questionnaire will be administered to caregiver of the moderately malnourished 6 – 59 months old child who was admitted into the SFP programme at least one month ago
- The beneficiary's admission measurements should be available in health facility registers/ration cards
- Questionnaire will be administered on the day of inclusion into the study
- For coded answers, indicate answer using the assigned code
- Assure respondent of their confidentiality and that the data is purely for academic use
- Interview code should be numbers assigned chronologically from 001. Interview code assigned to participant should tally with the code assigned in objective v data capture sheet

Section A. Basic Details		
A1.	Sub – county	
A2.	Ward	
A3.	Health facility	
A4.	Interviewer's Name	
A5.	Date questionnaire is completed (dd/mm/yy)	
A6.	Date of admission into SFP (dd/mm/yy)	
A7.	Interview code	

Section B: Demographic data						
B1.	B2	B3	B4	B5	B6	B7
Participant	Gender 1. Male 2. Female	Date of birth	Age (Indicate in months for child and in years for caregiver)	What is the relationship of caregiver to child a. Parent of child b. Guardian of child c. Grand parent of child d. Others specify [QUESTION APPLICABLE TO CAREGIVER] [INDICATE CODE IN THE SPACE PROVIDED BELOW]	What is your (caregiver) major source of income? 1. Salaried or waged 2. Casual labor 3. Sale of livestock and livestock products 4. Sale of crops 5. Depends on handouts 6. Others specify [QUESTION APPLICABLE TO CAREGIVER] [INDICATE CODE IN THE SPACE PROVIDED BELOW]	What is your (caregiver) highest school qualification? 1. No formal education 2. Primary school dropout 3. Primary school 4. Secondary school dropout 5. Secondary school 6. Tertiary education 7. Others specify [QUESTION APPLICABLE TO CAREGIVER] [INDICATE CODE IN THE SPACE PROVIDED BELOW]
1. Caregiver (respondent)						
2. Child						

Section C: Availability and utilization of SFP commodities at health facility level		
	Question	Answer (Indicate code)
C1	Did you receive Ready to Use Supplementary Food (RUSF)/ Plumpy sup in the previous distribution? 0 = No 1 =Yes	
C2	If yes, how many sachets of RUSF (plumpy sup) did you receive in the previous distribution? 1.<14 2. 14 3. >14	
C3	Does RUSF (plumpy sup) last for the recommended 2 weeks? 0 = No 1 =Yes	
C4	If no, how long does it last in days?	
C5	If the ration ran out before the end of 2 weeks, give the main reason for this a. Received less than entitled to b. Shared with non SFP registered household members c. Shared with non – household members (specify who?) d. Sold part/all ration e. Losses in the home f. Other reason(specify)	
C6	How many sachets are consumed by the child per day? a. One sachet b. More than one sachet	
C7	How is Plumpy SUP (RUSF) fed to the child? a. Directly eaten from sachet	

	<ul style="list-style-type: none"> b. Mixed with food c. Scooped with finger d. Others specify 	
C8	<p>During admission, did you receive instructions from health workers on how to utilize RUSF at house hold level?</p> <p>0 = No</p> <p>1 =Yes</p>	

Section D: Nutritional knowledge of care giver on Infant and Young Child Nutrition and breastfeeding practices		
D1	<p>Did you receive nutritional counselling at the time of your child's admission into the SFP programme?</p> <p>0 = No [MOVE TO QUESTION D5]</p> <p>1 = Yes</p>	
D2	<p>What information did you receive during nutritional counselling? [MULTIPLE ANSWERS]</p> <ol style="list-style-type: none"> 1. Encouraged to continue breastfeeding beyond 6 months together with appropriate complementary feeding 2. Informed about balanced diet 3. Discouraged from withholding of feeds during illness 4. Informed of intake of small frequent enriched feeds 5. Encouraged to bring all their children below 5 years old to the nearest health facility for growth monitoring and vitamin A supplementation every 6 months 6. Others [SPECIFY]_____ 	
D3	<p>Have you been practicing what you were taught during nutrition Counselling?</p> <p>0 = NO</p> <p>1 = Yes [MOVE TO QUESTION D5]</p>	
D4	<p>IF NO TO QUESTION D3, ASK. What prevents you from practicing what you were taught? [MULTIPLE ANSWERS]</p> <ol style="list-style-type: none"> 1. Cultural factors 2. Inadequate food access 3. Maternal illness/roles/career that hinder mother from breasting 4. Limited access to health care services (long distances to health facilities, lack of health staff, lack of nutritional supplements etc.) 5. Others [SPECIFY]_____ 	
D5	<p>Why was your child admitted into the SFP programme? [SELECT OPTION 1 IF BENEFICIARY GIVES ANSWER RELATED MALNUTRITION]</p> <ol style="list-style-type: none"> 1. Treatment of MAM 2. I don't know 3. Others specify 	

D6	At what point will your child be discharged from the SFP programme? [MULTIPLE ANSWER QUESTION] <ol style="list-style-type: none"> 1. Beneficiary recovery (Cured) 2. Prolonged nonattendance (defaulter) 3. Non recovery 4. All of the above 5. I don't know 	
D7	At what age did you introduce complementary feeds to your child? <ol style="list-style-type: none"> 1. Below 6 months 2. At 6 complete months 3. N/A (Has not yet introduced) 	
D8	ASK FOR CHILDREN 6-23 MONTHS. Do you still breastfeed your child even after introduction of complementary feeds? 0 = No 1 =Yes	
D9	If yes, up to what age do you intend to continue breast feeding your child? <ol style="list-style-type: none"> 1. Up to 24 months 2. I'll continue breastfeeding on demand regardless of age 3. Up to my next pregnancy 4. Others specify (in months)..... 	
D10	Did the child breast feed yesterday? 0 = No 1 =Yes	
D11	Cumulatively, how many times do you breastfeed your child during the day and during the night?	

D12 IF YES TO QUESTION D7 ASK. What did the child eat yesterday? [TICK APPROPRIATELY IN THE SPACE PROVIDED]			
D12a.	Food Group	Specific food	Tick appropriately
D12b	Bread cereals, pasta, rice	grains (maize, millet, sorghum, wheat)	
D12c		roots and tubers (potatoes, yams, cassava)	
D12d	Vegetable group	Vitamin A rich vegetable (carrots, pumpkin, dark green vegetables such as spinach, tomato, kales, amaranth, orange sweet potatoes)	
D12e		Other vegetables (cabbages, lettuces)	
D12f	Fruit groups	Vitamin A rich fruits and vegetables (mangoes, pawpaw,)	
D12g		Other fruits (bananas, watermelon, orange)	
D12h	Meat, poultry, fish, dry beans, eggs and nuts	Pulses (beans, green grams, lentils, cowpeas, pigeon peas, and nuts)	
D12i		Fresh animal flesh (meats, fish, poultry, liver and organ meat)	
D12j		Eggs	
D12k	Milk yoghurt, cheese	Milk, cheese, yogurt, sour milk	
D12l	Fats oil, sweets	Fats oil, sweets	
D13	How many times a day is the child fed on solid foods? 1. 1 – 2 meals per day 2. 3 – 5 meals per day 3. More than 5 meals per day		

7.13 ADDENDUM 6: DATA CAPTURE SHEET

Admission date	Id. No.	Address	Age	Sex	Admission criteria	Visit 1			Visit 2			Visit 3			Visit 4		Visit 5		Comment
						Wt	Ht	Muac	Wt	Ht	Muac	Wt	Ht	Muac	Wt	Muac	Wt	Muac	

Address: physical address/mobile number

Admission criteria: W/H, MUAC, return defaulter or transfer from OTP

Discharge criteria: cured, defaulter, death, and transfer to OTP, non-recovered

Wt, Ht, MUAC: indicate Weight (wt), Height (Ht) and MUAC measurements per visit

Data from health facility register of beneficiaries who were discharged from the programme within one month before the study

ID. No: identification number assigned to the beneficiary for the purpose of the study to avoid using names for confidentially reasons

Address: physical address/mobile number

Age: Age of child in months

Admission criteria: W/H, MUAC, return defaulter or transfer from OTP

Discharge criteria: cured, defaulter, death, and transfer to OTP, non-recovered

Wt, Ht, MUAC: indicate Weight (wt), Height (Ht) and MUAC measurements per visit

7.14 ADDENDUM 7: PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM.

Title of the research project: Evaluation of the Supplementary Feeding programme targeted at moderately malnourished children aged 6 to 59 months in Baringo County Kenya.

Reference number: 17204658-12

Principal investigator: Irene Wairimu Kimani

Address: P.O. Box 68-00614 Wangige, Kenya Lower Kabete

Contact number: +254723879566 You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or community health worker or the doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

The study will be conducted in a total of 34 health facilities in Marigat, Baringo Central, North and East Pokot sub Counties, where supplementary feeding programme (SFP) is currently operational. The study will aim at evaluating the performance of the programme in Baringo County. Questionnaires will be administered to caregivers of 496 children who are currently enrolled in SFP and anthropometric measurements (MUAC, weight and height) of the children taken in order to assess progress in nutritional status. The study is purely for academic purposes for partial fulfilment of the requirements for the award of master of nutrition. The data from all sub counties will be collected for a period of three weeks. Your participations in the study will take a maximum of two hours.

Why have you been invited to participate?

You have been invited to participate in the study because your child has been admitted in the SFP programme for more than one month, and hence it is easier to measure the impact the programme has had in your child's nutritional status. In the event that your Child's admission measurements are not available in the SFP register or in the ration card, the child will not be included in the study as the researcher will not have a baseline value (MUAC, weight and height measurements, before admission into SFP) to compare with the current nutritional status.

What will your responsibilities be?

You will be asked questions on the quality of SFP services that you and your child receive at the health facility, SFP food utilization at household level and nutrition. You will also avail your child for weight, height and Mid Upper Arm Circumference measurements (MUAC).

Will you benefit from taking part in this research?

Your participation in the study will inform the stakeholders on the performance of the programme and hence shed light on the gaps in implementations that need to be address.

Are there in risks involved in your taking part in this research?

The study will be part of the routine SFP processes at health facility level with an additional requirement to answer the questions as stated above. Therefore the study poses no risk to you or to your child **If you do not agree to take part, what alternatives do you have?**

It is not mandatory to take part in the study and if you do not agree to take part, you will still continue accessing SFP services at health facility level.

Who will have access to your medical records?

The study staff and the community health workers will have access to the SFP register where the MUAC, weight and height measurements of your child are recorded. The data collected will be kept highly confidential and your identity and that of your child will remain anonymous. However, the study monitors (supervising lecturers and members of the Research Ethical Committee) may need to inspect research records, including the SFP register. Your name or that of your child will not be recorded, but instead will be replaced by a unique identification number. The researcher will have direct access of the research findings and will share the findings of the study with relevant stakeholders when the data for the whole county is analyzed.

What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

N/A Will you be paid to take part in this study and are there any costs involved?

You will not be paid to take part in the study and there will be no costs involved for you, if you do take part in the study.

Is there anything else that you should know or do?

- You have a right to be told any new relevant information that arises during the course of the research and the informed Consent form will be revised, where appropriate to incorporate this information.
- You can contact the Researcher Irene Wairimu Kimani at telephone number 0723879566 if you have any further queries or encounter any problems.
- You can contact the Health Research Ethics Committee at 021-938 9207 if you have any concerns or complaints that have not been adequately addressed by the researcher.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I agree to take part in a research study entitled Evaluation of the Supplementary Feeding programme targeted at moderately malnourished children aged 6 to 59 months in Baringo County Kenya.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) on (*date*) 2016.

Signature of participant _____ Signature of witness _____

Declaration by investigator I Irene Wairimu Kimani declare that:

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use an interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.*)

Signed at (*place*) on (*date*) 2016.

Signature of investigator _____ Signature of witness _____

Declaration by interpreter

I (*name*) declare that:

- I assisted the investigator (*name*) to explain the information in this document to (*name of participant*) Using the language medium of Pokot, Tugen and Gems.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) on (*date*)

Signature of interpreter _____ Signature of witness _____

