

HAWD OF TOGDHEER

**NUTRITION SURVEY
AUGUST, 2003**

FSAU/MOHL/SRCS



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ABBREVIATIONS AND ACRONYMS

ARI	Acute Respiratory Infections
FAO	Food and Agriculture Organisation
FEG	Food Economy Group
FSAU	Food Security Assessment Unit
GAM	Global Acute Malnutrition
Ha	Hectares
H/A	Height for Age
IDP	Internally Displaced People
KM	Kilo Metres
MCH	Maternal and Child Health
MT	Metric Tonnes
NCHS	National Centre for Health Statistics
NGOs	Non-Governmental Organisations
NIDs	National Immunisation Days
OR	Odds Ratio
SACB	Somalia Aid Coordination Body
UN	United Nations
UNICEF	United Nations Children's Fund
WFP	World Food Programme
W/H	Weight for Height
WHO	World Health Organisation

Definitions

Deyr Season:

Short rains normally expected from October to December in southern Somalia. Deyr rains are less widespread and less reliable than the Gu rains. They are usually patchy and localised. Its harvest is normally expected between December and January and provides key food requirement to take households through the Jilaal season. The harvest is normally not significant when compared to the primary/main harvest of the year.

Gu Season

The main rainy season in Somalia normally expected between April and June. About 70% of the annual crop and livestock production depend on the Gu rains. This is the heaviest and most reliable rainfall in Somalia. Its harvest is normally expected between July and August.

Jilaal Season

This is the dry season of the year in Somalia normally between January and March. There is normally no crop production during this season and the river levels normally drop. Consequently, most livestock migrate in search of water and pasture during this period.

ACKNOWLEDGEMENT

The Nutrition Surveillance Project of the Food Security Assessment Unit (FSAU) acknowledges the participation of the Ministry of Health and Labour(MOHL),Somali Red Crescent Society (SRCS) and UNICEF in the Hawd of Togdheer Nutrition Survey.

The overall contribution of MOHL in coordination and supervision, community mobilisation, provision of a training venue and facilitation in the training of the supervisors and enumerators is highly appreciated.

The MOHL and SRRC provided staff to serve as enumerators and supervisors.

UNICEF provided anthropometric equipment and support during data analysis.

Special thanks goes to the mothers, caregivers, leaders and the community as a whole in the Hawd of Togdheer for their cooperation, time and for providing information individually and in focus group discussions that helped the survey team to get a better understanding of the nutrition situation in the area.

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FSAU also expresses its sincere appreciation to the survey team for their high level of commitment and sincerity demonstrated during all stages of this survey.

EXECUTIVE SUMMARY

The nutrition survey was undertaken in the Hawd of Togdheer, an eco-zone in the Togdheer region.

Administratively, the Hawd covers four districts of the Togdheer region namely Duruqsi, Odweine, Ballidling and Bohodle. The area is mainly a pastoralist eco-zone whose inhabitants keep mainly goats with the exception of the plains of Tunyo, Arori and Qool- Adey where sheep dominates.

In the last decade the Hawd pastoralists have been most vulnerable to droughts compared to the other pastoral food economy zones in Togdheer and North West region. According to a food security baseline assessment conducted by FSAU and partners in January 2003, livestock population figures had declined by about 45% in the last decade with cattle experiencing the highest decline 95 %, sheep 50%, goats 20 % and camel 15%. The decline has mainly been due to land degradation thus reducing the carrying capacity of the land. The remaining 5% of the cattle is owned by the rich while the middle and the poor households do not own any cattle.

No recent systematic study of the nutrition situation has been conducted to reveal the likely impact of the livelihood changes on human welfare. Thus between 17th and 24th August 2003 a baseline nutrition and mortality survey was undertaken in the area by FSAU in collaboration with the Ministry of Health and Labour (MOHL) and Somali Red Crescent Society (SRCS). The aim of the survey was to determine the nutrition status of children between 6-59 months or 65-110 cm using weight for height index. The survey also sought to establish factors influencing the nutrition status and to provide recommendations for interventions based on the findings.

A 30x30 sampling methodology was applied for both the nutrition survey and the mortality assessment. A total of 904 children were assessed from 483 households for the nutrition survey while 905 households were assessed for the mortality assessment. Additional information was generated through secondary data review, observation, focus group discussions and key informant interviews.

A high proportion 75% of the households reported purchasing as their main food source (mainly rice, pasta and sugar). About 17 % reported animal and animal products as their main food source with only a small proportion 2.9% and 3.8% reporting social support and crop production respectively. Collectively, small business and sale of animal/animal products accounted for a higher proportion (58%) of the households' source of income. The other income sources were casual work 18.7%, sale of crops 8.6%, remittances 8% and salaried employment 6.5%. The survey having been conducted during the hunger gap the coping mechanisms during this period were through remittances about 29%, social support 35%, sale of more livestock 27%

At the time of the survey, food availability and access was in terms of milk and cereals with the majority purchasing mainly pasta and rice. Milk was also available at the household level. However, this suggests poor diet diversity among children who were mainly receiving porridge, Anjera, rice and tea. Given that fruits and vegetables were not available both at the households and the local markets then there is no doubt that these kinds of foods are rarely included in the diets hence low consumption of those foods that are rich in micronutrients.

The Majority of the people were getting water from berkads 70% while the rest were depending on protected wells 13.2% and open wells 12.8%. Ownership and use of latrine is low in the area, with only about 17% of the respondents indicating ownership and use of latrines.

The survey established that about 63% of the households seek medical assistance when the child is sick. Of those who seek healthcare assistance, over 50% consult private clinics/pharmacies about 20% consult traditional practitioners and 20% public health facilities.

Those who reported not seeking healthcare services when a member is sick mentioned distance and high transport costs as the major problem.

Incidences of diarrhoea within two weeks prior to the survey was 16.3%, ARI and malaria was 17.1 % within the same period. while Incidences of measles among the under-five population within one month prior to the survey was about 7%.Measles immunisation coverage at the time of the survey was low 18.9% and so was Vitamin A supplementation during the last six weeks prior to the survey with only 27.4%. of the children having received vitamin A within that period.. Despite the important role played by sound breastfeeding and complementary feeding practices in child health, the survey revealed suboptimal practices.

At the time of the survey, about 47% of the children aged between 6-24 months were breastfeeding. Of those who had been stopped from breastfeeding, about 17% had stopped breastfeeding quite early before 6 months, 41.6% between 6-11 months while only 31% of children were stopped from breastfeeding after the first year of their life. A high proportion, 81%, of the children aged between 6 and 24 months were introduced to foods other than breast milk too early in life between the time of birth and the fifth month of life. About 67% of the children are fed three times in a day while only about 20% of the children were fed more than four times in a day.

The prevalence of total/global acute malnutrition was 10 %(CI 8.1- 12.1) (W/H<-2 z-scores or oedema), while severe acute malnutrition defined as (<-3 z-score or oedema) was 1.3 %.(0.7- 2.4).The rate is however not significant when compared with that of a survey in the neighbouring area, the Hawd of Hargeisa May/June 2002 that showed a GAM of 8.8 %(CI 7.1- 10.9). Malnutrition rate was found to be highest among children aged 48-59 months 13.1% and lowest among children aged below one year at 5.1%. However, no statistically significant association between malnutrition rate and child sex ARI, Malaria, measles, lack of vaccination against measles, lack of supplementation of vitamin A and few inadequate frequency of feeds < than 3 times per day was noted. The only risk factor that had association with malnutrition was diarrhoea. Children with diarrhoea were 2.3 times more likely to be malnourished compared to those not suffering from diarrhoea in the last two weeks prior to the survey.

Results of the mortality assessment revealed an under five mortality rate of 2 deaths/10,000 children/day and a crude mortality rate of 0.83 deaths /10,000 people per day both depicting an alert situation. The deaths were mainly attributed to high incidences diarrhoea, ARI, malaria and measles and can therefore be further associated with poor access to basic health care e.g suboptimal water and sanitation practices , late treatment and poor management of child illnesses and low vitamin A supplementation.

The current high incidences of diseases among children, suboptimal sanitation practices, use of contaminated water, poor care practices, low levels of measles immunisation and vitamin A supplementation revealed by the survey could put children under five at increased nutritional risk. This is due to the strong synergetic relationship between protein energy malnutrition and infections such as measles ,ARI and diarrhoea. Although there was no statistical significance between malnutrition and risk factors except for diarrhoea, there is need to step up basic health care services, since these factors could easily aggravate the current levels of malnutrition

Following discussions of the results with partners, the interventions below were suggested.

1. Intensify the minimum package for health and nutrition care for children and women through
 - Accelerating EPI and micronutrient supplementation coverage.
 - Improving access to primary health care services
 - Exploring possibilities of providing cold chain where MCHs exist
 - Increasing access to antenatal and postnatal services

- Increasing health services e.g. interventions on sanitation and hygiene, Malarial control
- 2. Promote nutrition education focusing on breastfeeding, complementary feeding and diet diversity
- 3. Environmental agencies should undertake environmental studies in order to initiate water programmes that have minimal negative impact in area.

Table 1.SUMMARY OF FINDINGS

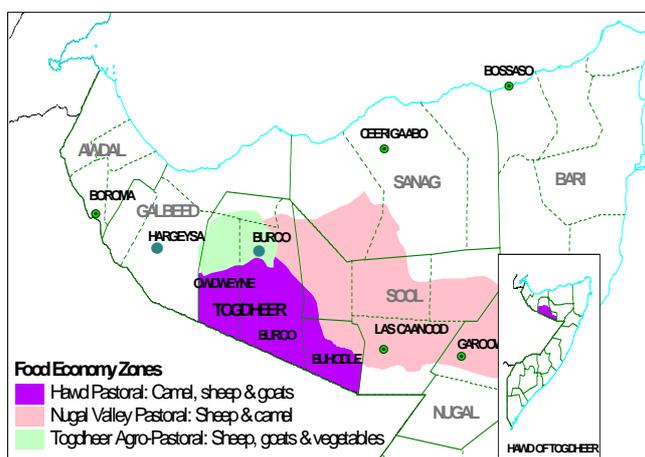
Indicator		
	No.	%
Under five children screened during the survey.	904	100
Global acute malnutrition- Weight for Height < -2 Z score or presence of oedema	90	10
Severe acute malnutrition - Weight for Height , -3 Z score or presence of oedema	12	1.3
Global acute malnutrition - Weight for Height < 80% of median or presence of oedema	51	5.7
Severe acute malnutrition - Weight for Height < 70 % of Median or presence of oedema	6	0.7
Oedema	6	0.7
Proportion of children with diarrhoea in last two weeks prior to the survey.	150	16.3
Proportion of children with ARI in last two weeks prior to the survey.	154	17.1
Proportion of children with Malaria in last two weeks prior to the survey.	154	17.1
Proportion of children with Measles in the one month prior to the survey.	63	7.1
Proportion of children supplemented with Vitamin A in last six months prior to the survey.	240	27.4
Proportion of children immunised against Measles	144	19.5
Under five mortality rate 2/10,000/day		
Crude mortality rate 0.83/ 10,000/ day		

1 INTRODUCTION

The nutrition survey was undertaken in the Hawd of Togdheer an eco-zone in the Togdheer region. From West to East, the Hawd of Togdheer eco-zone starts from Geed- Ballar village, which falls administratively in Gabilay Distrct. It borders the Zone four of Ethiopia while in the south it borders Hargeisa and the foothills of Golis Guban and Togdheer region extending to Sool region and to Puntland.

Administratively, the Hawd covers four districts of the Togdheer region namely Duruqsi, Odweine, Ballidling and Bohodle. The area is mainly a pastoralist eco-zone whose inhabitants keep mainly goats with the exception of the plains of Tunyo, Arori and Qool-Adey where sheep dominates. The population is estimated at 38250 (WHO & UNICEF NIDs)

Within the last decade there has been high rural urban migration from the Hawd to neighbouring Burao town, especially the youth who leave to look for job opportunities. This out-migration of youths has been caused by high poverty levels that resulted from the recurrent livestock trade ban, the returnees from refugee camps and persistent droughts in the area.



1.1 Survey Justification

In the last decade the Hawd pastoralists have been most vulnerable to droughts compared to the other pastoral food economy zones in Togdheer and North West region. According to a food security baseline assessment conducted by FSAU and partners in January 2003, livestock population figures had declined by about 45% in the last decade with cattle experiencing the highest decline 95 %, sheep 50%, goats 20 % and camel 15%. The decline has mainly been due land degradation thus reducing the carrying capacity of the land. The remaining 5% of the cattle is owned by the rich while the middle and the poor households do not own any cattle.

No recent systematic study of the nutrition situation has been conducted to reveal the likely impact of the livelihood changes on human welfare. Thus between 17th and 24th August 2003 a baseline nutrition and mortality survey was undertaken in the area by FSAU in collaboration with the Ministry of Health and Labour (MOHL) and Somali Red Crescent Society (SRCS). The aim of the survey was to determine the nutrition status of children between 6-59 months or 65-110 cm using weight for height index. The survey also sought to establish factors influencing the nutrition status and to provide recommendations for interventions based on the findings.

1.2. Survey Objectives

- To determine the level of malnutrition through anthropometric measurements using weight for height of children between 6-59 months or 65-110 cm.
- To determine the coverage of measles vaccination and vitamin A supplementation in children 6-59 months
- To assess the ability of people to meet their food needs.

- To establish possible factors influencing child nutrition in the Hawd of Togdheer.
- To estimate under 5 mortality and crude mortality rates in the 13 months prior to the survey
- To provide recommendations for future interventions based on the findings.

2 BACKGROUND INFORMATION

2.1 General background

.In the past, the Hawd of Togdheer was considered a high potential grazing land. Over the years, the area has been greatly degraded and almost all the palatable grass species have been depleted. .This has occurred as a result of increased deforestation for charcoal burning/building materials, recurrent droughts and trampling of animals in an unplanned manner resulting to significant gully erosion during the rainy season. The Gu is the main rainy season while the Deyr while the Deyr season also contributes significantly to pasture availability in the area prior to the Jilaal season. The area receives a yearly annual rainfall of 200 to 300 mm. The`area`is usually categorised as "bush land" range type. In the Hawd the gap between population growth and economic growth is widening year after year¹

2.2. Food security overview

In the Hawd of Togdheer the major source of the income and food is livestock except in a few pockets(such as Qaloocato and Bicile) that depend on both crops and livestock. The pastoralists have significant trade links with the bigger urban centres like Burao, Hargeisa, and Berbera. Apart from food items being sourced from, and livestock trade carried out through these main centres, the youth from the Hawd normally go to these towns to seek job opportunities from which they remit income to members of their families residing in the Hawd. During the difficult times those left in the rural areas get considerable social support from their urban relatives. During the normal year the Hawd pastoralists migrate within the surrounding areas for better grazing and only during a bad year do those living along the border cross the border to zone four of Ethiopia.

Wealth breakdown of the inhabitants of the Hawd is as follows: the poor 20-35 %, middle 45-55%, better off 10- 25% and the rich 2-5%. For the last decade droughts were more frequent compared to previous decades. Since 1998, the year 2002 was the best year whereby normal Deyr and GU rains were received. Despite the livestock trade ban the terms of trade were favourable and livestock prices were close to normal.

Table 2: Main food security events affecting food security in the Hawd of Togdheer.

Period	Major event
1998	Bad year Livestock ban, low purchasing power Below normal GU rains and very poor Deyr rains resulted in low livestock production
1999	Normal year Livestock ban lifted Normal GU rains followed by below normal Deyr rains and good terms of trade
2000	Bad year High livestock deaths Low GU rains and poor Deyr rains resulting to very low livestock production poor terms of trade.
2001	Bad year Near normal GU rains and normal Deyr rains
2002	Normal Year Normal GU and Deyr rains Livestock prices become closer to normal
2003	GU rains normal

2.3. Humanitarian operations in Hawd of Togdheer

Humanitarian organisations working in the area include OXFAM, SC-UK, WFP and UNHCR. OXFAM has provided significant support in water and sanitation and has recently started a pastoral programme whose overall objective is to facilitate development of pastoral associations and empower them to influence decisions affecting their lives at village, district and regional levels. Within the Hawd area, ten villages have been supported to construct a total of seventy nine berkards and twenty one latrines. As a way of promoting sustainability of the activities, communities have been trained on sanitation and hygiene, and masons trained on construction of slabs. In addition OXFAM supported initiation of a revolving fund for support of new activities at the village level. It is currently administered by the village development committees. Currently OXFAM is working in collaboration with UNHCR and WFP to support development and rehabilitation of water resources through food for work. SC-UK is working in collaboration with the Ministry of Education to support basic education in the all the four districts.

2.4. Health

The Ministry of Health with the support from UNICEF-Hargeisa is supporting a system of healthcare provision through four MCHs and nine health posts. The MCHs are located in each of the four districts that form the Hawd mainly in the densely populated permanent settlements/centres. Odoweyne has three health posts, Buhodle three, Baldhing one and Duruqsi two. There are also plans to have additional seven other health posts in the area. They are estimated to serve about 68% of the population. The MCHs are managed by auxiliary nurses who have been trained on the job while the health posts are managed by trained Community Health Workers (CHWs). So far 9 CHWs have been trained and more are in the process of being trained.

2.5 Morbidity

Suspected malaria, diarrhoea and respiratory infections are the main reported causes of morbidity and mortality among infants and young children. The Ministry of Health and Labour estimates that Acute Respiratory Infections (ARI) accounts for about 40% of the morbidities,

diarrhoeal diseases 30% while malaria accounts for about 19 %ⁱⁱ.

2.6. Water and environmental sanitation

Water shortage is a major problem for both the humans and the livestock, becoming more acute during the jilaal season (January-April) during the bad year. In the normal year the wealthier population provide water to the poor free of charge except during the Jilaal when water prices are very high..There exist no permanent water sources in the Hawd area and prospects for deep ground water development. are poor. Water is obtained mainly from Berkads, ballis, and some shallow wells in some villages around EL-Hume and Berato that are highly dependent on the rainfall received in a given season.

2.7. Previous nutrition surveys in Hawd of Togdheer

No recent nutrition survey has been conducted in the Hawd of Togdheer. However, a nutrition assessment using Mid Upper Arm Circumference (MUAC) of less than 12.5 cm for defining malnutrition was conducted in Boohodle district in 2001. It revealed that 14.6% of the children were moderately malnourished (MUAC<12.5 cm >_11cm) while 2.3% were severely malnourished(MUAC<11 CM) with no cases of oedema observed. Of the total children screened, 40% were either malnourished or at risk of malnutrition. Burao IDPs check survey results.

3 METHODOLOGY

3.1. Survey Design

This study was both descriptive and analytical in nature. Using a standard questionnaire (see appendix) quantitative data was collected. Mortality assessment was concurrently conducted using a questionnaire attached in the appendix section. Additional qualitative data were collected through focus group sessions, key informant interviews and secondary data review. Data collection took place between 20th and 24th August 2003.

3.2. The sampling procedure

Using a two-stage cluster sampling methodology, 30 clusters were randomly selected based on population proportion to size. A list of villages, and sections in the case of major urban settlements in the ecozone with their respective populations was used to construct cumulative population using figures from MOHL based on National Immunisation Days (NIDs).

An estimated population of 38250 was used from which a sampling interval was calculated. The sampling interval was determined by dividing the total population by 30. The calculated cluster interval was **1275 (See Annex: 1)**. The first cluster was selected by choosing a random number between 1 and 1275 using random number tables.. The next and subsequent clusters were determined by adding the cluster interval to the preceding random number. Due to insecurity problem One of the randomly selected cluster Xadhadhanka was replaced with Coodinle the nearest accessible village occupied by population with similar characteristics. This is the area where the Hawd borders Puntland. From the 30 randomly selected clusters, a total of 904 children between the heights/length of 65 and 110cm and 6-59 months old were screened during the survey.

3.3. Study population and sampling criteria

The study population consisted of people living in the region and comprised of all the children aged 6-59 months or measuring 65-110 cm for height/length. On the visit to each cluster, the centre was identified and a pen was spun to determine the direction to follow in the selection of the households with children aged 6 to 59 months or 65-110 cm. The total number of the households from the centre to the end was established and given numbers to enable random selection of the first household with a child of the required age or height. From the first household with a child aged 6-59 months or 65-110 cm, the same direction was followed to get the next household. On reaching the edge of the cluster the right-hand direction (clockwise direction) was followed until details of 30 children were collected from that cluster. If a cluster was exhausted of children before the required 30 children had been reached, a neighbouring area was randomly selected. All eligible children in the household were measured and if a child or primary caregiver was absent, an appointment was booked for a later visit in the course of survey. If a child was in a relative or neighbour's house, the child could be called and accessed.

3.4. Data collection

Anthropometric measurements

The anthropometric data were collected using the procedure stipulated by the WHO (1995) for taking anthropometric measurements. Adherence to this procedure was ensured. The protocol used was as follows:

Weight. Salter Scale with calibrations of 100g-unit was used. This was adjusted before weighing every child by setting it to zero. The female children would be lightly dressed before having the weight taken while clothes for the male children were removed. Two readings were taken for each child and the average recorded on the questionnaire.

Height. For height, a vertical or horizontal measuring board reading a maximum of 175cm and capable of measuring to 0.1cm was used to take the height or length of a child. The child would stand on the measuring board barefooted; have hands hanging loosely with feet parallel to the body, and heels, buttocks, shoulders and back of the head touching the board. The head would be held comfortably erect with the lower border of the orbit of the eye being in the same horizontal plane as the external canal of the ear. The headpiece of the measuring board was then pushed gently, crushing the hair and making contact with the top of the head. Height/length was then read to the nearest 0.1cm. Two readings were recorded and the computed average used in the analysis.

Length. For children aged 6 to 24 months or between 65cm to 84.5cm length instead of height was taken. The child was made to lie flat on the length board. The sliding piece was placed at the edge of the bare feet as the head (with crushing of the hair) touched the other end of the measuring device. Then two readings were taken and the average computed.

Child age determination

Difficulties were encountered in determining the exact ages of children. Useful documents like growth monitoring/clinic attendance cards, or any other viable formal card were used when available. Calendars of events (see in the appendix) were also used as proxies to accurate age determination. Though not entirely accurate, ages were still regarded as important indicators though not used for anthropometric analysis and were approximate/average pointers. The nutrition indicator employed was *weight for height* as interest was in the wasting status (acute malnutrition).

Oedema

Defined as bilateral oedema on the lower limbs detected by gently pressing the feet to check if a depression is left after at least three seconds of pressing.

Morbidity

Diarrhoea: Diarrhoea was defined for a child having three or more loose or watery stools per day.

Measles: A child with more than three signs of the following was considered having measles: fever, and skin rash, runny nose or red eyes, and/or mouth infection, or chest infection

Acute Respiratory Infection (ARI): Asked as *oof wareen or wareento*. The signs asked included cough, rapid breathing and fever.

Suspected malaria/acute febrile illness: The signs to be looked for are periodic chills, fever, sweating and sometimes a coma.

Mortality

A proxy indication of mortality was taken retrospectively to provide some idea on the health situation of the population. The mortality assessment was done concurrently with nutrition survey in which a 30 by 30 cluster sampling methodology was used. The survey methodology used for the nutrition survey was adopted with the exception that households were selected as the second sampling unit. The selection of clusters and households were the same as for nutrition survey. At least 30 households were randomly selected in each cluster and the mortality questionnaire administered to a responsible member of that household. **All households within the selected cluster were eligible for inclusion** in the mortality survey, whether a child under five years was present or not. Households were systematically surveyed until the 30th household. Each household surveyed was asked the composition of their members in two parts; - those members less than 5 years and the total number of household members. The household was then asked how many if any of the household members had died in the last three months. The mortality questionnaire is appended in the report. A total of 905 households with or without under-five child/children at the time of the survey were included in the survey.

The overall mortality was calculated by taking the total number of deaths multiplied by a factor (10,000). This was divided by the population of the surveyed households using the formulae below:

$$MR = n / \{[(n+N) + N] / 2\}$$

Where n = total number of persons reported dead in the households surveyed

N = total number of people living in those households at the time of survey

The mortality was calculated retrospectively for the past 3 **months**, the recall period. Mortality rates per 10,000 persons per day were obtained by dividing the figure above by 93 days that was used as the recall period. Calculation of under-five mortality rates was done using the same formulae but with a denominator of under-five children in the surveyed households.

In case a member had died, the household was asked to explain the signs and symptoms of the person before he/she died.

Mortality rates can be interpreted according to the following reference

- For under-five years old children
 - Under-five mortality rates ≥ 2 deaths/10,000/day indicate a situation of alert
 - Under five mortality rate ≥ 4 deaths/10,000 children/day indicate an emergency
- For the total population
 - Mortality rates ≥ 1 deaths/10,000 persons/day indicate an alert situation
 - Mortality rates ≥ 2 deaths/10,000 persons/day indicate an emergency.

3.5. Description of survey activities

Table 3: Chronology of activities for the nutrition survey

Major Activity	Dates. 2003
Preparation of tools, methodology, review of secondary data, & contacting partners on the ground (Hargeisa)	August 4 – 16
Training of enumerators and pre-testing (Burao ,)	August 17 – 19
Cluster Identification	August 19
Collection of data	August 20 – 24
Entry of data and preliminary analysis	August 25/08- 1/9/03
Presentation of preliminary results	30/09 /03
Report writing	30/08/- 15/9/03
Circulation of report	16 – 30/9/03

Six teams consisting of two enumerators and one supervisor collected the data with each team handling one cluster in a day. An elder from a particular village/cluster assisted the teams in identification of the cluster and its centre. Supervisors were seconded from the participating partners namely; MOHL, SRCS, and FSAU. Overall support, supervision and co-ordination was done by FSAU nutritionists and one MOHL staff from Hargeisa regional office. The FSAU nutrition focal point, the PHC coordinator and Regional Medical Officer from Togdheer region assisted in the identification of the qualified enumerators.

3.6. Quality control procedures

A comprehensive training of enumerators and supervisors was conducted covering survey objectives and design, interview techniques, sampling procedure, inclusion and exclusion criteria, sources of errors taking of measurements, standardising the questions in the questionnaire, levels of precision required in measurements, diagnosis of oedema, verification of deaths and oedema within households, handling of equipment and the general courtesy during the survey.

Rigorous standardisation of measurement and pre-testing of the questionnaire and equipment was carried out in one of the villages (not selected for data collection). Standardisation involved taking repeated measurement of 10 children from a MCH by all the teams and comparing with some reference. Pre-testing also involved familiarising survey teams with village/cluster entry; administering the questionnaire, sampling procedure, correct taking of measurements and documentation. After the field exercise, views were exchanged to address the difficulties identified, appropriateness of the questions reviewed and necessary changes were made.

The quality of data was also ensured through (i) close monitoring of fieldwork by FSAU team,, MOHL staff one from Hargeisa and the PHC coordinator of the area, (ii) crosschecking of filled questionnaires on daily basis and (iii) daily review undertaken with the enumerators to address any difficulties encountered, (iv) progress evaluation was carried out according to the time schedule and progress reports shared with partners on regular basis,

(v) continuous data cleaning after entry in the field that made it easy to detect any outliers/ mistakes and to replace or repeat households depending on magnitude of error and (vi) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights.

3.7.Data analysis

Entry, cleaning, processing and analysis

Data was entered and analysed using EPIINFO computer based package. Running and tabulating all variable frequencies was carried out as part of data cleaning. The EPINUT programme was used to convert the measurements (weight and height) into nutritional indicators and comparison made with the National Centre for Health Statistics (NCHS) references as designed by WHO (1983).

General characteristics of study population

Frequencies and cross-tabulations were used to give percentages, means and standard deviations in the descriptive analysis and presentation of general household and child characteristics.

Creation of nutritional status indices

The anthropometric measurement of weight and weight were used to compute the W/H nutritional status indicators of the studied children. Weight For Height (W/H) expressed the weight of the child as a percentage of the expected weight for the standard child of that height as given by NCHS. WFH measures acute malnutrition or wasting. Using EPINUT Z-scores were generated and the anthropometric indicator, WFH, was used to classify children into categories of nutritional status as follows:

- < -3 Z-Scores or oedema = Severe acute malnutrition
- 3 Z-Scores \leq WFH< -2 Z-Scores = Moderate acute malnutrition
- <-2 Z-score or oedema = Global/total acute malnutrition
- \geq -2Z-Scores = Normal

4 SURVEY RESULTS

4.1 Household characteristics of study population

The nutrition survey covered a total of 483 households with a mean household size of 6.5 persons (SD=2.8) While the mean number of the under fives per household was 1.9 children per household.. Male headed households comprised 66.7% while female-headed households formed 33.7 %. About 98% of the surveyed households were in their usual areas of residence.

4.2 Food sources, income sources and coping strategies

Table 4: Food sources, income sources and survival strategies

Food source	N	%
Market based source of food/Purchases	361	75.4
Own animal/product Sources	81	16.9
Social support	14	2.9
Others (e.g. crop production)	18	3.8
Income source	N	%
Small business	158	33.2
Sale of animal & animal products	119	25
Casual work	89	18.7
Sale of crops	41	8.6
Remittances/Gifts	37	7.8
Salaried employment	31	6.5
Coping Strategy	N	%
Remittances	141	29.6
Social support	168	35.2
Sale of more livestock	131	27.5
Others	37	7.8

A high proportion 75% of the households reported purchasing as their main food source (mainly rice, pasta and sugar). About 17 % reported animal and animal products as their main food source with only a small proportion 2.9 % and 3.8 % reporting social support and crop production respectively Collectively, small business and sale of animal/animal products accounted for a higher proportion (58%) of the households' source of income. The others were casual work 18.7%, sale of crops 8.6%, remittances .8% and salaried employment 6.5%.The survey having been conducted during the the hunger gap the coping mechanisms at the time of the survey was through remittances about 29%, social support 35%, and sale of more livestock 27%

4.3 Water and sanitation and health seeking behaviour

Table 5: Water, sanitation and health seeking behaviour

	N	(%)
<i>Main source of drinking water (n=476):</i>		
Berkads	333	70
Protected well	63	13.2
Open wells & ponds	61	12.8
Others (ponds, dams)	19	4
<i>Sanitation facility (n=476):</i>		
Latrine ownership & use	83	17.4
Bush/open grounds	393	82.6
<i>Observe (n=74):</i>		
Used and clean	59	79.7
Unused	411	5.4
Used and dirty		14.9
<i>Health seeking behaviour</i>		
	N	(%)
<i>Seek healthcare assistance when child is sick (473):</i>		
Yes	302	63.3
No	175	36.7
<i>Where (n=302):</i>		
Private clinic/pharmacy	172	57
Traditional healer	63	20.8
Public health facility	61	20.2
Others	4	2

The majority of the people, 70%, obtain water from berkads while the rest 13.2% and 12.8% depend on protected and open wells respectively.

Ownership and use of latrine is uncommon in the area, with only about 17% of the respondents indicating ownership and use of latrines. For those who own and use the latrine about *80% kept them clean. About 63% of the households seek medical assistance when the child is sick.. Of those who seek healthcare assistance, over 50% consult private clinics/pharmacies about 20% consult traditional practitioners and 20% public health facilities. Those who reported not seeking healthcare services when a member is sick mentioned distance and high transport costs as the

major problem.

4.4 Characteristics of study children

As indicated in table 6 a total of 904 children were surveyed of whom 53% were boys and 47% girls. Most of the surveyed children were in the age group 48-59% about 25%

4.5 Nutritional status of survey children using anthropometry

Table 6: Distribution according to age and sex

Age category in months	Boys		Girls		Total	
	N	%	n	%	N	%
6-11	46	46.5	53	53.5	99	11
12-23	93	47.2	104	52.8	197	21.8
24-35	120	60	80	40	200	22.1
36-47	99	55.3	80	44.7	179	19.8
48-59	121	52.8	108	47.2	229	25.3
Total	479	53	425	47	904	100

As indicated in table 7, total/global acute malnutrition (<-2 z-scores or oedema) was 10% while severe acute malnutrition (<-3 z-score or oedema) was 1.3%, Oedema cases alone accounted for 0.7%.

Table 7: Summary of Global Acute malnutrition and Severe Acute Malnutrition

Malnutrition Rates	Proportion	No.
Global Acute Malnutrition (<-2 Z score or oedema)	10 (CI 8.1-12.1)	90
Severe Acute Malnutrition +(<-3 Z score or oedema)	1.3 (CI 0.7-2.4)	12
Oedema	0.7(0.3-1.5)	6

The malnutrition rate as indicated in table 9 by percentage of median <80% or oedema was 6.6% thus showing about 3.4 % difference in malnutrition prevalence compared to the Zscore indicator which has a more strict cut off

Table 8: Distribution of nutritional status (using weight for height z-score) by sex

	Severe <-3Zscore	Moderate < -2Z and ≥3z_scores or oedema	Oedema	Total malnutrition	Normal (>-2Zs)
Males	3(0.7%)	46 (9.6%)	3 (0.7%)	52 (10.9%)	427(89.1%)
Females	3(0.84%)	32(7.5%)	3(0.8%)	38 (8.9)	387(91.1%)
Total	6(1.3%)	78(8.6)	6 (0.7%)	90 (9.9)	814(90 %)

The table above indicates that the boys were more malnourished than girls, however, there no statistical difference between the two sexes

Table 9: Malnutrition prevalence using W/H percentage of median categories

PERCENTAGE OF THE MEDIAN							
Nutrition categories	status	Males		Females		Total	
		Proportion	No.	Proportion	No.	Proportion	No.
Total malnutrition (W/H<80% of the median)		5.7%	27	5.7%	24	5.7%	51
Total malnutrition (W/H<80% and/or oedema)		6%	30	6%	27	6.6%	60
Severe malnutrition (W/H<70% of the median)		0.6%	3	0.7%	3	0.7%	6
Oedema		0.3%	3	0.3	3	0.6	6
Severe malnutrition (W/H<70% and/or oedema)		0.9%	6	1%	3	1.9%	9

Table 10: Nutrition status using W/H z-scores or oedema according to age groups

Age groups	Severe (<-3z or oedema)	Moderate (>=-3z/<-2z)	Total malnourished (<-2z or oedema)	Normal (>-2 z or no oedema)
6-11 months	2 (2%)	5 (5 %)	7 (5.1%)	92 (92.9%)
12-23 months	3 (1.5%)	17(8.6%)	20(10.1%)	177(89.8%)
24-35 months	4 (2 %)	14 (7.6%)	18 (9.6%)	182 (91.6%)
36-47 months	1(0.6)	14 (7.8%)	15 (8.4%)	164 (91.6%)
48-59 months	2(0.9)	28 (12.2%)	30 (13.1%)	199(86.9%)
Total	12 (1.3)	78 (8.6%)	90 (9.9%)	814 (90.1%)

The nutritional status of the surveyed children by age groups shown above indicate that malnutrition rate was highest among children aged 48 -59 months and lowest among children below one year. Further analysis however showed that malnutrition had no statistical significance between the age groups

4.6 Mortality Rates

A total of 905 households were surveyed for mortality indicator with a follow-up period of 93 days prior to the assessment. The results are presented below:

Mortality rates;

For children aged 0-69 months (under-five mortality rate)

Under five population in surveyed households =1223

Number of under five deaths =23

Under five mortality rate =2 deaths per 10,000 children per day

For the total population

Total population in surveyed households =5419

Total number of deaths in the households =42

CMR =0.83 deaths per 10,000 persons per day

4.7 Health, feeding practices and immunisation coverage for survey children

Morbidity, measles immunisation and vitamin A supplementation

Tables 11: Morbidity, measles immunisation and vitamin A supplementation

.	Number	%
<i>Incidence of major child illnesses (n=904)</i>		
Diarrhoea in the last two weeks	150	16.3
Malaria in the last two weeks	154	17.1
ARI in the last two weeks	154	17.1
Measles in the last one month	63	7.1
<i>Measles immunisation</i>		
Children receiving measles vaccination (9 - 59 months) (N=804)		
Children receiving measles vaccination	652	81.1
<i>Vitamin A supplementation N=875</i>		
Children receiving Vitamin A supplementation in past 6 months	240	27.4%

As indicated in table 12 incidences of diarrhoea within two weeks prior to the survey was 16.3% while both ARI and malaria was 17.1 % within the same period.. Incidences of measles among the under-five population within one month prior to the survey was about 7%.Measles immunisation coverage was low .about 19% Likewise Vitamin A supplementation during the last six weeks was also low with only 27.4%. of the children having received vitamin A within that period..

Feeding practices

Table 12: Feeding practices

	N	(%)	
<i>Are you breastfeeding child (age 6-24months) (n):</i>			
Yes	138	46.8	At the time of the survey, about 47% of the children aged between 6-24 months were breastfeeding. Of those who had been stopped from breastfeeding, about 17% had stopped breastfeeding quite early before 6 months, 41.6% between 6-11 months while only 31% of children were stopped from breastfeeding after the first year of their life. A high proportion, 81%, of the children aged between 6 and 24 months
No	157	63.2	
<i>Age when child stopped breastfeeding (n=147):</i>			
0 - 5 months	26	17.4	
6 - 11 months	62	41.6	
12 months or more	61	31	
<i>Weaning age (n=296 (i.e. 6 -23 months aged):</i>			
0 - 3 months	104	35.1	
3 – 5 months	136	46	
6 months or more	56	18.9	
<i>Feeding frequency (n=898):</i>			
Once	12	1.3	
2 times	97	10.8	
3 times	602	67	
4 or more times	187	20.8	

were introduced to foods other than breast milk too early in life between the time of birth and

the fifth month of life. About 67% of the children are fed three times in a day while only about 20% of the children were fed more than four times in a day.

4.8 Risk factors in relation to malnutrition

Table 13: Relationship between malnutrition and other factors

Exposure variable	<i>n</i>	<i>p-value</i>
<i>Child sex:</i> Male	1.21 (0.82-1.81)	0.39
<i>:ARI</i>	1.11 (0.74-1.66)	0.69
<i>Diarrhoea:</i>	2.26 (1.5- 3.4)	0.0001
<i>Malaria:</i>	1.05 (0.63-1.74)	0.98
<i>Measles:</i>	1.5 (0.79-2.84)	0.32
Not vaccinated against measles	1.35 (0.84-2.18)	0.26
<i>VitaminA:</i> not supplemented	1.23 (0.81-1.89)	0.39
<i>Few frequency of feeding < 3 times per day</i>	0.76 (0.39-1.48)	0.52

Further analysis revealed no statistical significant association between malnutrition rate and child sex ARI, Malaria, measles, lack of vaccination against measles, lack of supplementation of vitamin A and few inadequate frequency of feeds < than 3 times per day. The only risk factor that had association with malnutrition was diarrhoea. Children with diarrhoea were 2.3 times more likely to be malnourished compared to those not suffering from diarrhoea in the last two weeks prior to the survey.

4.9 Qualitative information

Alongside the household questionnaire qualitative information was generated from six focus groups discussions mainly with women and key informants interviews (see list in the appendix). The discussions were centred around practices on breast feeding, complementary feeding and care of children, health care, food security, and water and sanitation issues.

Care, Infant and young child feeding practices

Overall, breast feeding and complementary feeding is sub-optimal. The majority of the mothers give water and sugar (*Fax*) immediately after delivery and start breastfeeding within 24- 48 hours. Reasons given for not starting breastfeeding immediately was that the mother

has no milk, the baby does not have the strength to suckle, the mother has abdominal pains and breastfeeding increases bleeding. In addition to the *Fax* and breast feeding, the infants are introduced to goats or cows milk within the first month while other semi solid foods such as porridge are introduced between 4-6 months. A few of the mothers use bottle feeding but the majority indicated use of a cup and spoon for feeding the children. Breast feeding continues for 12-18 months unless a mother gets pregnant before this time

The most common food fed to young children is light porridge made from sorghum or maize mixed with sugar and milk, rice with milk and sugar and ghee, *Anjera* (Somali pancake). Children are fed five times a day except in times of scarcity when meals are reduced between 2-3 times a day. It was noted that children always get priority in getting food both during normal and crisis time. The focus group further revealed that when children are sick certain foods are withheld, for example if a child has diarrhoea, milk is withheld, while pregnant mothers avoid eating a lot because of the common belief that the baby will be big and thus the mother will have complicated child birth. Most of the mothers indicated that care for children depends on the season. During a unfavourable season, mothers give less care to their children since they have to go long distances to look for water, food and grazing thus devoting less care to the children.

Food security

The pastoralists are well integrated into the market economy and depend more and more on purchased foods with the main source of income being sell of livestock and livestock products. It was observed that there is limited income earning opportunities except a few tea and general shops. During normal times the people purchase mainly rice, sorghum, cowpeas while during crisis they purchase mainly rice. It is a normal practice that during the hungry season, they cope by selling more livestock and getting more social support including remittances.

This year's GU rainfall was timely and evenly distributed except in some villages such as Galoolay, Godwaraebe, Qaloocato and Bilcile. The later two are agro pastoral and had below normal harvests. At the time of the survey the areas had received rains for the previous 2 days. The Livestock body condition at the time of the survey was good and livestock production (milk, ghee and meat) remains normal. However, due to below normal rains of the 2002 GU season the camel conception rates were low and this is reflected in a lower calving rate and overall production during this years Gu. Sheep and goats production was normal following good Deyr rains and thus goat milk production is expected to cover the income deficit from camel milk sales and will possibly increase access to household food sources. Overall the food security situation in the Hawd is normal due to the good rains that have improved livestock body condition and milk production.

Health care

It was established that .access to health services is poor with some people having to travel over 20- 30 Kms to reach the nearest health facility. Some of these areas include; Galool ,Gatiitaley ,Hajii Salaah Villages. Others indicated that the cost of transport to bigger towns where the health facilities and private pharmacies are located as well as the cost of medical care is high, hence limiting their access to basic health care.. Consequently, families indicated that they sought conventional medical assistance only when the home remedies had failed.

Water and Sanitation

It was established that the majority get water from Berkeds, Ballis and a few hand dug wells. However a significant number of the water sources are silted and therefore not being used thus denying a large population access to water for both livestock and domestic use. Being the end of the dry season, people were already experiencing water stress. However rains had started two days before the survey.

The water is of poor quality caused by contamination of human waste. Human waste is usually disposed in the open and in case of children it is done within the compound as latrines are not commonly used. When it rains some of this waste finds its way into the water sources. Similarly, the food hygiene during preparation is sub-optimal mainly caused by inadequate water and low awareness on personal and food hygiene.

5. DISCUSSION

Food security situation: Food sources, income and coping mechanisms

The last Gu rainfall 2003 was normal except in the agro-pastoral areas where the production was below normal. At the time of the survey livestock body condition was good and livestock production (milk, ghee and meat) was also normal. Most families surveyed noted adequate intake of animal products (milk and meat), with Ghee exchanged for cash. Overall the food security situation in the Hawd is normal due to improved livestock body condition and milk production. The terms of trade were particularly favourable for the pastoral households with one local goat exchanged for 50 kg of rice.

At the time of the survey, food availability and access was in terms of milk and cereals with the majority purchasing mainly pasta and rice, and milk being available at the household level. However, this suggests poor diet diversity among children who were mainly receiving porridge, Anjera, rice and tea. Given that fruits and vegetables were not available both at the households and the local markets then there is no doubt that these kinds of foods are rarely included in the diets hence low consumption of foods that are rich in micronutrients.

The level of coping strategies during the time of the survey remained normal whereby the community were getting support from relatives leaving in Burao town or outside as well as sale of more livestock. This is a normal practice .during the hunger season just before the rain season.

Health issues influencing nutritional status

The incidences of common infections among children within two weeks prior to the survey were high with diarrhoea at 16.3%, ARI and malaria 17.1%. Incidences of measles among the under-five population within one month prior to the survey was also high at about 7%. The majority of the families (57%) seek medication from private health services and pharmacies while only one-fifth of the population visit public health facilities (including those run by international organizations).

Given the low health care coverage and poor access caused by the high cost of transport to the health facilities and pharmacies, it is unlikely that the sick children get proper healthcare. It was also established from the focus group discussions that the mothers seek medical assistance late after the home remedies have failed. Similarly the situation could have contributed to the extremely low measles vaccination and Vitamin A supplementation..

The relationship between diseases and nutrition is well documented. Infection causes increased metabolic needs, increased nutrient losses through mal-absorption, diarrhoea, vomiting, and parasitic utilisation of nutrients. Infection can also cause decreased dietary intake through anorexia. The resulting nutritional deficiency causes impaired immunity and increased vulnerability to more infection resulting in a vicious cycle of infection and malnutrition. Further

analysis noted an association between diarrhoea and malnutrition and hence the need to create more awareness among staff and care givers on prevention and management of diarrhoea.

Thus, the current high incidences of diseases among children, sub-optimal sanitation practices, use of contaminated water, poor care practices, low levels of measles immunisation and vitamin A supplementation could put children under five at increased nutritional risk by aggravating the current levels of malnutrition.

Mortality

Results of the mortality assessment revealed an under five mortality rate of 2 deaths/10,000 children/day thus depicting an alert situation and a poor health situation. The crude mortality rate was at 0.83 deaths /10,000 people per day. The deaths were mainly attributed to high incidences diarrhoea, ARI, malaria and measles and can therefore be associated with poor access to basic health care e.g sub-optimal water and sanitation practices , late treatment and poor management of child illnesses and low vitamin A supplementation.

Water and Sanitation

The majority (about 70%) of the families get water from Berkards. However some sections of the Hawd were already experiencing water problems as it was the end of the dry season. The water is of poor quality mainly associated with contamination by human waste especially in the settled areas. Qualitative information generated indicate that human waste is usually disposed in the open and in case of children it is done within the compound since latrines are not commonly used, only 17.4% own and use them. When it rains some of this waste finds its way into the water sources. Similarly, the food hygiene during preparation is sub-optimal mainly caused by inadequate water and low awareness on personal and food hygiene. Hence, the limited access to potable water, poor human waste disposal and sub-optimal hygiene practices are major challenges which require appropriate attention

Childcare and its effect on nutritional status

Exclusive breastfeeding and sound complementary feeding practices are vital for enhancing the nutritional and health status of infants and young children. WHO and UNICEF recommend, that infants should be exclusively breastfed at least for the first six months of life. Feeding children with foods and fluids other than breast milk during this period significantly reduces breast milk supply, and increases the risks of deaths from diarrhoea and respiratory infections.

Overall, breast feeding and complementary feeding was found to be sub-optimal. The majority of the mothers give water and sugar (*Fax*) immediately after delivery and starts breastfeeding within 24- 48 hours. Results of the survey show that. a high proportion, 81%, of the children aged between 6 and 24 months were introduced to foods other than breast milk early enough in life between the time of birth and the fifth month of life. About 67% of the children are fed three times in a day while only about 20% of the children were fed more than four times in a day.

This could be attributed to low awareness on the benefits of appropriate breast feeding and weaning practices as well as the cultural beliefs and practices among the care givers and the community as a whole.

Nutritional status

The global/total acute malnutrition rate was 10% with a severe acute malnutrition rate of about 1.3% which is within unacceptable levels according to WHO classifications. The rate is

however not significant when compared with that of a survey in the neighbouring area, the Hawd of Hargeisa May/June 2002 that showed a GAM of 8.8 % (CI 7.1- 10.9). Malnutrition according to age revealed that children aged 6-11 were the least malnourished 5.1% with children in the 48-59 age group being the most malnourished 13.1% although no statistical significance between this age group and malnutrition. was noted. A higher representation of this age group by slightly over 25% of the children measured despite correct use of the height criteria was noted, but this did not affect the survey results since there was no statistical significance between age groups. This could mean that those qualifying were actually over five but stunted in growth. Boys were found to be more malnourished than girls although no relationship between the sex could be established. The reason for higher malnutrition among the boys is unclear as there are no known discriminatory feeding practices in the Somali culture. However further analysis showed no relationship between risk factors and malnutrition except for diarrhoea

5 CONCLUSION AND RECOMMENDATIONS

The current high incidences of diseases among children, sub-optimal sanitation practices, use of contaminated water, poor care practices, low levels of measles immunisation and vitamin A supplementation revealed by the survey could put children under five at increased nutritional risk. This is due to the strong synergetic relationship between protein energy malnutrition and infections such as measles , ARI and diarrhoea. Although there was no statistical significance between most of the common child infections and malnutrition except diarrhoea, there is need step up basic health care services, since these factors could easily aggravate the current levels of malnutrition which is at the moment at border line.

The survey results were presented to both local and international agencies in Hargeisa on 14th September 2003, and the following were suggested as possible interventions based on the findings.

1. Intensify the minimum package for health and nutrition care for children and women through
 - Accelerating EPI and micronutrient supplementation coverage.
 - Improving access to primary health care services
 - Exploring possibilities of providing cold chain where MCHs exist
 - Increasing access to antenatal and postnatal services
 - Increasing health services e.g. interventions on sanitation and hygiene, Malarial control
2. Promote nutrition education focusing on breastfeeding, complementary feeding and diet diversity
3. Environmental agencies should undertake environmental studies in order to initiate water programmes that have minimal negative impact in area.

6 7. APPENDICES

Appendix 1.Sampling frame for the Hawd of Togdheer survey August 2003

Location	Population Estimate	Cumulative population	Cluster Number
1.Cadow Yuormra	370		
2. Ali Saahid	240	610	1
3.Harada	1000	1610	
4.Bisiq	150	1710	
5.Bilcile	300	2060	2
6..Ali Ciise	280	2340	
7.Yucub Yabooh	700	3040	
8. Gorayo Xunta Sare	100	3140	
9. Gorayo X hoose	240	3380	3
10. Waraabeeye	640	4020	
11.Bilcilwayso	210	4230	
12. Sanyare	180	4410	
13.Lebiguun	150	4560	4
14. Bali hule	150	4710	
15. Isku Dhooy	100	4810	
16.Suryo Qansah	80	4890	
17. Naq Dhajo	100	4990	
18.Gunbur libaah	200	5190	
19.Geedi haan	100	5290	
20. Beeli eeday	150	5440	
21. Quaduc safar	100	5540	5
22. War-Cimraan	450	5990	
23. Shansha Adde	350	6340	
24.Mohamed Ugaas	180	6520	
25. Taalo-buur	240	6760	
26. Bali- dhiing	2000	8760	6,7
27. Habeedley	150	8910	
28. Riyo Xidhan	150	9060	
29. Dheriyaley	80	9140	
30. Dhagadheer	140	9280	
31.Sibidhley	200	9480	
32. Dhoqoshey	410	9890	8
33. Jaama Khadan	200	10090	
34. Nasiye	350	10440	
35. Bali Calanle	270	10710	
36. Heero	150	10860	9
37. Nabaqabad	240	11100	
38. Duruqsi	2000	13100	10
39.Qoryaale	300	13400	11
40. Coodiinle	350	13750	
41.Qori lugud	380	14130	
42. Xadhadhanka	1700	15830	12
43.Cagaran	120	15950	13
44. Libaaxle	400	16350	13
45. Xaaji Saalah	3000	19350	14,15

46. Mulaaxo	710	20060	16
47. Khaaxo	350	20410	
48.Gocon dhaley	940	21350	17
49.Dabe goroyaale	1600	22950	18
50. Xay daanle	2000	23150	19
51. Abdi faarah	410	23560	
52. Abdi dheere	460	24020	
53. Qol qol	400	24420	
54.Gu dubi	510	24930	20
55. Baarcad	340	25270	
56.Qudhac Kudlah	310	25580	
57. Gala taley	1100	26680	21
58. Odowayne	5000	31680	22,23,24, 25
59.Ceel Xuule	710	32390	
60. Ceel Bile	280	32670	26
61. Xaaxi	3000	35670	27, 28
62. Goraya ood	400	36070	
63. Habaas Waya	180	36250	
64. Jeenxo Laaye	250	36300	
65. Cali faara	400	36700	29
66. Geeh Didis	400	37100	
67. Beerato	1000	38100	
68.Obsiye	150	38250	30

Cluster sampling interval 1275 and 1st Random number 610

Appendix 2. HAWD OF TOGDHEER NUTRITION SURVEY: QUESTIONNAIRE

Date _____ Team Number _____ Cluster Number _____

Name of Interviewer _____

Name of Village/Town _____ Name of section _____

Household Number _____ Name of the household head _____

Q1. Sex of the household head 1=Male 2=Female

Q2. Household size _____

Q3. Number of <5 years in the household _____

Q4. Household residence status: 1=Residents 2= Internally displaced 3=Returnees 4= Others (specify) _____

If answer to the above is 1, then move to Questionnaire 8.

Q5. Place of origin _____

Q6. Duration of stay (in months) _____

Q7. Reason for movement: 1= Insecurity 2= Lack of jobs 3= Food shortage 4= Water shortage 5= Others (specify) _____ Q8-Q13 Household background information

<p>Q8.Households main food source</p> <p>1=Animal products from own production 2=Household crop production 3=Purchases 4=Remittances/Gifts 5= Begging 6= Wild foods collection 7= Others (specify) _____</p>	<p>Q9. Households main income source</p> <p>1=Small business 2=Casual work 3=Salaried employment 4=Sale of crops 5=Sales of animals and animal products 6=Remittances/Gifts 7=Others (specify) _____</p>	<p>Q10. How does this household survive during food shortage (coping strategies)?</p> <p>1=Remittances/gifts 2=Sale of more livestock 3=Splitting of family 4=Begging 5=Borrowing 6=Food aid 7=Purchases 8=Wild food collection 9=Others (specify)____</p>	<p>Q11. Source of drinking water</p> <p>1=Borehole 2=Open wells 3=Protected wells 4=Catchments/pond 5=Berkads 6=Streams/river 7=Muscid 8=Tap/piped water 9=Tanker/truck vendor 10=Others (specify)_____</p>	<p>Q12. facilities 1=Pi 2=Fla 3=Bu grou Obse Q12b Cono facilit above 1=Us clear 2=Ur 3=Us dirty 4=Ot</p>
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Q14-18. Anthropometry for children aged 6 – 59 months (or 65 – 110cm) in the household.

Sno	Name	Q14. Sex 1=male 2=Female	Q15. Age in months	Q16. Oedema 1=Yes 2=No	Q17. Height (cm)	Q18. Weight (kg)
1						
2						

3						
4						

Q19-28 Morbidity, feeding and immunization status of children aged 6 – 59 months (or 65-110 cm) in the household.

Sn o	Name	Q19. Diarrhoea in the last two weeks 1=Yes 2=No	Q20. ARI in the last two weeks 1=Yes 2=No	Q21. Malaria in the last two weeks 1= Yes 2= No	Q22. Measles in the last one month 1=Yes 2=No	Q23. Vaccinated against measles 1=In past six months (by card) 2=In past six months (by recall) 3=Before six months (by card) 4=Before six months (by recall) 5= None	Q24. Vitamin A provided in the last 6 months 1=Yes 2=No	Q25. Are you breast feeding the child? 1=Yes 2=No	Q26. If not breast feeding, how old was the child when you stopped breast-feeding? 1=less than 6 months 2= 6 – 11 months 3=12 – 18 months 4= 18 months or more
1									
2									
3									
4									

Appendix 3.MORTALITY QUESTIONNAIRE SET

Qaabka Su'aalaha Qoyska ee Foomka dhimashada.

Date _____ Team Number _____ Cluster Number _____

Tariikh _____ Numbarka koxda _____ Kalaster Numbar _____.

Name of Interviewer _____ Name of Village/Town _____

Magaca waydiiyaha _____ Magaca Tuulada/magallo _____

Name of section _____ Household Number _____

Magaca Qaybta _____ Nambarka Gurga _____.

Name of the household head _____

Mgaca madaxa Qoyska _____

MORTALITY MODULE SU'ALLAHA DHIMASHADA.	
CHILD: <i>(This questionnaire should be preferably administered to all women in the household)</i>	
1. Have you ever given birth? Weligaa ilma ma dhashay. <i>(Birth- a child who ever breathed or cried or showed signs of live even if he/she lived only a few minutes or hours)</i> <i>Ilma nool oo neefsanaya markuu dhasho oo leh callmadihii nololed.</i>	Yes..... Haa No..... Maya
2. Have you any other child in this household who is not your biological child? Ilma aadan dhalin ma idin la' nool yahay.	Yes..... Haa No..... Maya
3. If yes to Q1 and/or Q2, then how many? Haddii su'aasha 1 ama 2 noqoto waa immisa. If No to both Q1 & 2, then go to Q11 <i>(List the names somewhere separate and account for everybody as per the questions below)</i> <i>Haddii ay noqdaan jawabta su'aalhaasi maya u gudub su'asha 11.</i>	No. below 5 years Tirada ka yar shan sano No. above 5 years Tirada ka weyn shan sano
4. Have you any live birth between the 20th May 2003 and now? Miyaad dhashay ilma nool intii u dhaxaysay 20 Bishii May 2003 iyo hadeertada aynu joogno.	Yes..... No..... Haa.....Maya If yes, how many?... Haddii ay haa tahay waa imisa?.....
5. Have you any under five child other than your own in your household coming in since the 20th of May 2003. Miyey jiraan wax carruur ah shan sano ka yar oo aadan dhalin oo idiin yimi ila bishii Maaajo 20keedii 2003.	Yes..... No..... Haa.....Maya If yes, how many?..... Haddii ay haa tahatay waa imisa.....
6. How many under 5yrs children were living in this household as on the 20 th of May 2003. Imisa carruura oo shan sano ka yar ayaa gurigan ku nool illaa bishii Maaajo 20keeda sanadkan 2003.	Number..... Tirada.....
7. How many Under 5yrs children live with you now? Imisa carruur shan sano ka yar ayaa hadda ku nool guriga.	Sons at home..... Imasa willaal ah Daughters at home Imisaa gabdh ah
8. Have you any Under 5yrs children born alive but do not live with you now? Imisa carruur shan sano ka yar oo aad nolol ku dhashay ayaan kula noolayn hadeer, ama iminka.	Yes.....Haa.....No..... Maya..... If yes then, how many? No. of sons Imisa will.....imisaa gabdhood.... No. of daughters
9. Do you have any Under 5yrs child who has died since the 20th of may 2003.? Imisa wax carruur shan sano ka yar ayaa kaa dhintay ilaa 20kii bishii MAAJO 2003.?	Yes.....No.....If yes, then Sons dead Haa.....Maya.....haday jirti imisa wiil.. ama gabdhood baa dhintay.....

	Daughters dead.....
10. If there has been death of an Under 5yrs child in this household, then what were the signs and symptoms of death?/suspected cause of death? Miyuu jiraa ilmo shan sano kar oo ka dhintay gurigan, muxuuse ahaa calamadaha ama waxa aad umalaynaysid inuu u dhintay.	Child1..... Ilmaha kowaad..... Child2..... Ilmaha Labaad..... Child3..... Ilmahasadexaad..... Child4
ABOVE FIVE YEARS OLD IN THE HOUSEHOLD(Inta ka weyn shan sanadood ee Gurigaan)	
11. How many above five years old were living in this household as on the 20th May 2003? Imisa qof oo shan sano ka weyn ayaa gurigan ku noolaa ilaa 20 bisha Maajo 2003? Ku qor magacyada meel gaara ee dadkan (List the names somewhere separate and account for everybody as per the questions below)b	Number >5yrs..... Tirada shan sano ka yar.....
12. Has there been any above 5yrs old who has come to the household since the 20th of May 2003.? Miyuu jiraa qof ka weyn shan sano oo meel kale idiin ka yimid/idin ku soo biiray ilaa 20kii May 2003.?	Yes..... No..... If yes, then how many..... Haa.....Maya..... haddii ay jirti waa imisa.....
13. H 14. as there been any above 5yrs old who has left the household since the 20th of May 2003.? Miyuu jiraa qof ka weyn shan sano oo gurigan ka tagay illaa 20kii bishii May 2003?	Yes..... No..... If yes, then how many..... Haa.....Maya haddii ay jirto waa imisa
15. How many above 5 yrs live in this household now? Imisa qof oo shan sano ka weyn ayaa ku nool gurigiina imika?	Number..... Tirada.....
16. Do you have any over 5 years old person in this household who has died since the 20th of May 2003.? Miyuu jiraa qof shan sano ka weyn oo gurigan ah oo dhintay ilaa 20kii bishii May 2003?	Yes.... No..... Haa.....Maya.....haday jirti imisaa ka yar shansano..... If yes, no. >5yrs.....
17. If there has been death of >5yrs person in this household, then what were the signs and symptoms of death? Haddii uu jiro qof ka weyn shan sano oo dhintay, maxay ahaayeen calamadihii iyo sababtii uu u dhintay, imisa qofbaa se dhintay?	Peron1..... Ilmaha 1aad..... Person2..... ILmaha 2aad..... Person3..... Ilmaha 3aad..... Person4

Appendix 4. TRADITIONAL CALENDAR FOR NUTRITION SURVEY IN HAWD OF TOGDHEER AUGUST 2003

Month	1998	1999	2000	2001	2002	2003
Jan.		55 Ramadan	43	31	19	7
Feb.		54	42	30 SAKO	18 lid Arafo	6
Mar.		53 lid Arafo	41 lid Carafo	29	17	5 5 lid Arafo
Apr.		52	40	28	16	4 1
May		51 Safar	39 Safar	27 C.Dastuur	15 Safar	3 Safar
Jun.		50	38	26 Rajal Dhexe	14	2
Jul.		49	37	25	13 R.Hore	1
Aug.		48 Rajal hore	36	24	12 R.Dhexe	
Sep.	59 Rajal Dhexe	47 Rajal dhexe	35	23 DAB SHID	11 Rajal Danbe	
Oct.	58 Rajal Dambe	46 rajal danbe	34	22 Ramadan	10	
Nov.	57	45 Shabcan	33	21	9 Ramadan	
Dec.	56 Ramadan	44 ramadan	32 Ramadan	20	8	

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Appendix 5: List of participants

S/N	Name	Designation	Organization/Designation
1	Faadumo Axmed	Enumerator	SRCS
2	Konesak Maxemed Asokor	Enumerator	SRCS
3	Nimo Saleebaan Muse	Enumerator	Community
4	Ahmed Mohamed Aideed	Enumerator	SRCS
5	Khadar Maxmud Jamaa	Enumerator	SRCS
6	Alrisaaf Maalim Mohamed	Enumerator	SRCS
7	Maxamod Hamu Duriye	Enumerator	MOHL
8	Ahmed Nur Abdallahi	Enumerator	MOHL
9	Saiw Farex Xirsi	Enumerator	MOHL
10	Raxma Saleobaan Aadan	Enumerator	MOHL
11	Basra Maxamed Faara	Enumerator	MOHL
12	Hayad Jamaa	Enumerator	MOHL
13	Hawa Ismail	Supervisor	SRCS
14	Nura Gurey	Supervisor/ coordinator	FSAU
15	Fuad	Supervisor/ coordinator	MOHL –PHC coordinator
16	Fuad	supervisor	MOHL- PHC coordinator
17	Osman Warsame	Supervisor	FSAU
18	Farah Muse Mohamed	supervisor	MOHL
19	Susan Kilobia	Coordinator	

Appendix 6: List of Key informants

S/N	Name	Designation	Organization/Designation
1	Dr. Mohamed	Regional Medical Officer	MOHL
2	Adan Nur	Prgramme Coordinator	OXFAM
3	Abdi Fara	Community Facilitator	'OXFAM
4	Mohamed Yusuf	Community Facilitator	OXFAM
5	Ibrahim Harir	Community Facilitator	OXFAM
6	Ibrahim Awke	Community Facilitator	OXFAM
7	Mohamud Mohamed	Finance & Adminstration	OXFAM
8	Dr. Ali Salah	National Programme coordinator	UNDP
9	Georges yang	Project manager	COOPI Burao
10	Richard Gueria	Project Administrator	COOPI Burao
11	Ibrahim Mohamed	Finance & Administration	SCK

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