

NUTRITION SURVEY

DHUSAMAREEB AND ADAADO DISTRICTS
Galgadud Region
Somalia

SEPTEMBER 2004

FSAU/UNICEF/SRCS



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ABBREVIATIONS AND ACRONYMS

ARI	Acute Respiratory Infections
FAO	Food and Agriculture Organisation
FEG	Food Economy Group
FSAU	Food Security Analysis Unit
GAM	Global Acute Malnutrition
Ha	Hectares
H/A	Height for Age
IDP	Internally Displaced People
MUAC	Mid Upper Arm Circumference
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
Ssh	Somali Shillings
UN	United Nations
UNICEF	United Nations Children's Fund
WFP	World Food Programme
W/H	Weight for Height
WHO	World Health Organisation

Definitions

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.

ACKNOWLEDGEMENTS

Food Security Analysis Unit (FSAU) acknowledges the participation of UNICEF and Somali Red Crescent Society (SRCS) in Dhusamareeb and Adaado nutrition survey. FSAU provided the overall planning, management, funding, training, supervision, data collection, entry and analysis and report preparation. SRCS undertook community mobilisation, provided a training venue, enumerators, supervisors and background information, while UNICEF gave support in training, supervision of the survey team during data collection, provided background information and reviewed the survey report. The contribution of background information by ICRC is also highly appreciated. In addition to providing information the Somali Association of Health Care and Education Development (SAHED) hosted the survey team.

Many thanks to the local authorities parents/care takers, community guides and the communities for giving time for interviews, information sharing individually and in focus group discussions, that helped the survey team get a better understanding of the nutrition situation in the area.

FSAU express their sincere appreciation to the entire survey team for the high level of commitment, sincerity and initiatives demonstrated during all stages of the survey.

EXECUTIVE SUMMARY

Dhusamareeb and Adaado districts of Galgadud region have a population estimated at 79,245 people (WHO, 2004). Both districts are located along the main tarmac road that connects the southern and northern parts of Somalia. The surveyed areas as well as other parts of Galgadud region are currently experiencing one of the worst humanitarian crises in over a decade as a result of drought, civil insecurity, deteriorating terms of trade and environmental degradation. The severe drought, now in its third year, has resulted in severe water and pasture shortage and subsequently poor livestock body condition and reduced productivity. Frequent inter-clan conflicts have worsened human suffering, interrupting livelihoods and occasionally causing internal displacements of people. A rapid nutrition assessment carried out in July 2004 in eleven villages in the two most food insecure districts indicated high levels of acute malnutrition and above expected levels of mortality. A follow-up nutrition survey was recommended.

The nutrition survey was undertaken between 15th and 22nd September 2004 by FSAU in collaboration with UNICEF and Somali Red Crescent Society (SRCS). A two stage cluster sampling methodology was used in the random selection of the sampling unit (children in the nutrition survey and households in the mortality data collection). The objective of the survey was to determine the levels malnutrition of children aged between 6 - 59 months or 65 - 110 cm in height/length using weight for height index as well as adult malnutrition using Mid Upper Arm Circumference (MUAC). Data related to the common childhood diseases, child feeding practices, access to basic health services, safe water, sanitation, care practices and food security were collected through the household survey, focus group discussions, interviews with key informants and observation. Retrospective mortality data for the last 90 days was collected concurrently among the study households using a two-stage random cluster sampling methodology. *Due to insecurity in some areas of Adaado district, some of the selected clusters were replaced by other clusters of similar characteristics, and thus the survey findings are representative of areas that could be accessed.*

A total of 928 children aged 6-59 months or measuring 65-110 cm from 424 households were examined. Survey findings indicate a global acute malnutrition (W/ H <-2 Z score or oedema) of 20.5% (CI 18.0-23.3) and severe acute malnutrition (W/ H <-3 Z score or oedema) of 2.5% (CI 1.6-3.7). The retrospective under five and crude mortality rate measured in 900 households was 2.39 deaths/10000/day while the crude mortality rate was 1.66 deaths per 10000 per day. The level of adult malnutrition was also high among pregnant women¹. About 7.9% of the pregnant women were at severe risk (MUAC < 20.7 cm) while 22.9% were at moderate risk (>=20.7 and < 23 cm) of malnutrition and mortality. Overall the prevalence of Vitamin A deficiency (VAD) was 6% as assessed by way of night blindness. Of the vitamin A deficient cases (n=52) about 27% were under fives while the rest 73% were above five years of age.

Overall, breast feeding and complementary feeding was found to be sub-optimal. A high proportion, around 81% of the children aged between 6 and 24 months were introduced to foods other than breast milk before the fifth month of life. All children came from households who reported to have employed at least one or more of the consumption coping strategies, 30 days prior to the survey. The most commonly used were (i) switching to low quality food (e.g. reduction in consumption of milk) 73%, (ii) limiting of portion size 60%, (iii) borrowing from relatives 33% and (iv) purchase of food on credit 32%. More than half of the children (55.3%) had consumed three or less food groups within 24 hours prior to the survey. About 44% had consumed 4 or more food groups within the same period. The most consumed food was cereals, consumed by 99.1% of the children, sugars 92.3% and fats 86.7%. Milk (including breast milk) was consumed by 60.3% of the children, meat by 22.1% and beans by 64.4%. The least consumed foods were fruit 4.6% and vegetables 14.1%. For the commonly consumed foods (cereals, sugar and fat) the main source was mainly borrowing. About 67% of the children came from households who reported that they had borrowed the cereal, about 60% had borrowed sugar and about 53% had borrowed fat

Although in the past, pastoralism has been the main source of livelihood in the area, survey findings indicate that only about 40% reported to be pastoralists, with 42% involved with petty trade or self employment and about 18% depended on sources such as begging and reliance on relatives. A general downward shift in all wealth groups was noted with increasing destitution and indebtedness at the lower end. Many of those who migrated with livestock entered into debt or exchanged livestock for the purpose with only 27% paying cash.

¹ Sphere recommended cut-off points for pregnant women and UNACC/SCN for the non-pregnant women were used.

Currently, access to water remains a serious problem in the surveyed area. Over 50% of the children came from households who were obtaining drinking water from boreholes, with about 27% accessing from unprotected wells and springs. The majority (over 70%) were travelling over 5 kilometres to fetch water. High prices charged by trucks limited the amount of water used in all households with the majority using 1.9 -2.5 litres per person per day which is below the recommended amount²

The findings indicate critical levels of global acute malnutrition, a situation that is likely to deteriorate further if urgent action is not taken. As a result of the drought, the pastoralists have lost large numbers of their livestock and the remaining livestock are extremely weak and in poor body condition. Access to milk is becoming increasingly difficult due to the reduced number of livestock and low purchasing power. Water remains a critical limiting factor for both livestock and humans thus predisposing the community to water related disease. Even with a normal Deyr 2004 season, recovery will take time since the pastoralists have lost most of their livestock including pack animals.

Following discussions with partners like UNICEF and SRCS in the field as well as with Humanitarian Response Group members of the SACB, the following recommendations have been made:

- Increase coverage of water trucking
- Targeted SFP/family ration through the MCHs
- Improve health care such as EPI and curative services
- CARE and WFP are currently exploring ways of supporting food interventions.

² Sphere recommends total basic water need of 7.5- 15 litres per day

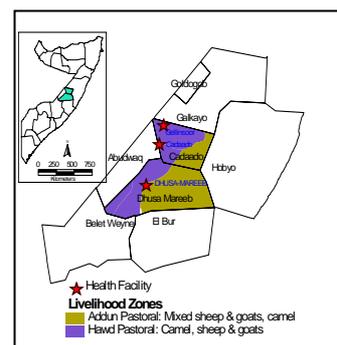
SUMMARY OF FINDINGS*Table 1: Summary of survey findings*

Indicator	Number	Percentage
Children under five years screened during the survey	928	
Global acute malnutrition – W/ H <-2 Z score or presence of oedema	191	20.5 % (CI 18.0-23.3)
Severe acute malnutrition – W/ H <-3 Z score or presence of oedema	23	2.5 % (CI 1.6-3.7).
Global acute malnutrition – W/ H <- 80% of median or presence of oedema	111	11.9
Severe acute malnutrition – W/ H <- 70% of median or presence of oedema	7	0.7
Oedema	0	0
Proportion of children with diarrhoea in two weeks prior to survey	364	39.1
Proportion of children with ARI in two weeks prior to survey	359	38.6
Proportion of children with malaria in two weeks prior to survey	90	9.7
Proportion of children with measles in one month prior to survey	116	12.5
Proportion of children supplemented with Vitamin A in the last six months prior to the survey	304	32.8
Proportion of children immunised against measles (9-59 months)	222	34.6
Proportion of children immunised against polio		
1-2 times	188	20.3
3 times	326	35.1
Under five mortality rate	2.39 deaths/10000/day	
Crude mortality rate	1.66 deaths/10000/day	

1 INTRODUCTION

The nutrition survey was conducted in Dhusamareeb and Adaado districts. The two districts form part of the seven Districts of Galgadud region. The others are Abudwaq, Balanballe, Elbur, Galhareri, and Eldher. Both districts have a total population of 79,245 people (WHO population estimates 2004). Both districts are located along the main tarmac road that connects the southern and northern parts of the country.

Dhusamareeb is the capital town of the region and the district borders Elbur in the south east, Beletweyne and Mataban district in the south west and Abudwaq in the west. Adaado district borders south Galkayo in the north, Ethiopia in the West and Mudug in the east. Pastoralism is the dominant type of livelihood comprising of 80-90 % of the total population with the rest being urban. The two districts fall under Hawd and Addun pastoral livelihoods with the dominant livestock being shoats; followed by camels, while cattle are the least kept species.



1.1 Survey Justification

Dhusamareeb and Adaado districts as well as other parts of central region of Galgadud region are experiencing one of the worst humanitarian crises in the past decade as a result of drought, civil insecurity, deteriorating terms of trade and environmental degradation. A rapid nutrition assessment carried out in July 2004 in 11 food insecure villages revealed high levels of acute malnutrition. Retrospective under five and crude mortality rate indicated an emergency situation. Since those results represented areas encountering of food insecurity, a nutrition survey was undertaken to establish the extent and magnitude of malnutrition in the two districts.

1.2 Survey Objectives

- To determine the levels of malnutrition through anthropometric measurements using weight for height of children aged 6 - 59 months or 65 - 110 cm tall.
- To establish factors influencing the nutrition status of children in relation to care practices, food security, health, water and sanitation situation.
- To determine the coverage of measles vaccination, polio immunisation and Vitamin A supplementation
- To determine the incidence of diarrhoea and ARI two weeks and measles one month prior to the survey.
- To find out the level of vitamin A deficiency in the survey area
- To determine the levels of malnutrition among adult women (15-49 years) using Mid Upper Arm Circumference.
- To assess the retrospective under five and crude mortality rate in the past 90 days.
- To provide recommendations based on findings

2. BACKGROUND INFORMATION

2.1. General background

Galgaduud Region is located in central region of Somalia. It has an estimated area of approximately 60,000 square kilometres. It borders, Hiran in the south east, middle Shabelle in the south, Mudug to the north, Ethiopian to the west and the Indian Ocean to the east. Dhusamareeb and Adaado fall under the Hawd and Addun livelihood zones whereby the pastoralists keep mainly shoats and camels. The average annual rainfall in both (Gu and Deyr) seasons, is 200-300 mm

At the time of the survey the general security situation in Dhusamareeb and Adaado districts was relatively stable except in the neighbouring areas of Harale and Elbur and some parts of northern Adaado. Traditional elders, community leaders and religious leaders are playing a key role in maintaining the security and peace in the area. Nevertheless, the perennial problems of civil insecurity in the region have played a significant role in worsening the human suffering and causing internal displacements of people. The security situation in Dhusamareeb and Adaado remains uncertain with frequent security incidences being encountered. Between May and Dec 2003 five major conflicts occurred. These have caused multiple waves of displacement for residents, loss of life, destruction of dwellings, water sources and destabilisation of livelihood patterns for the affected communities as well as considerable environmental degradation. Mostly the cause of these problems are grazing land and sharing water from shallow wells. This has resulted to destruction of resources and substantial internal displacement from the conflict areas of Harale, Elbur and the area between Adaado and Hobyo.

2.2 Food security overview

The cumulative impact of several seasons of rain failure has overstretched pastoralist's ability to cope with drought. Various reports by FSAU supported by different humanitarian agencies have revealed a worsening humanitarian situation and food insecurity in Galgaduud region which puts the region among the most drought stricken regions in Somalia. The drought situation has had adverse effects on livelihood assets.

Natural capital: The main water sources are berkads, shallow wells, boreholes and balleys. During the dry periods, the berkads play a vital role for the water needs (almost 50-60%) of the households. Berkads and water catchments have dried up thus contributing to water scarcity. Currently, water costs are now \$ 2.2/drum which is a 400% increase compared to the normal average baseline price of \$0.6. Private and NGOs specifically the ICRC can hardly cover 10-20% of the community water needs. Charcoal production is increasingly being practiced in both districts of Dusa-mareeb and Adaado with a clear environmental degradation observed in Bali-cad and Ceel-garas villages where a wide spread charcoal burning was noted during this survey. The severity of the situation is clearly indicated by putting it in the history book and labelling it as "Muudal Xooga" meaning the drought that had not spared people.

Physical Capital: Livestock the main livelihood asset are in poor body condition. The visible carcasses of dead animals as observed along the road sides during the survey could possibly demonstrate a high mortality rate of livestock loss reported by the pastoralists. The situation is mainly attributed to the prolonged drought



now in its third year. The practice of burning spiny shrubs known as "Jeerin" to remove the thorns and thereafter, crushing to feed the shoats is a clear indication of pastoralists despair for animal feed. Although migration is among the main coping strategies used for both livestock and human in the region, it is currently limited by the nature and uniformity of the drought through out the central and neighbouring regions. Due to reduction in pack animals transport remains a serious problem in the area. This is caused by extra activities during this time of hardship like delivering water from the water points to far places and increase of delivering frequency of to water for both human and livestock.

Financial Capital: The main income sources are through sale of livestock and livestock products. Income from these sources has greatly reduced due to the poor body condition, low productivity and increased livestock deaths. There is a high level of indebtedness accumulation in the last 2-4 seasons mainly to buy water and food.

Social Capital: Strong social support exists and represents the backbone of the economy among the poor pastoralists in the region. The level of support received by these poor pastoralists depends on the magnitude of the drought/season and the number and relationship they have with the better off (both Diaspora and local). The weakening of the social support is further highlighted by increasing number of destitute people in water points and urban centres.

Human Capital: Emaciated children could be observed especially among the destitute families. A situation likely to affect the long term physical and intellectual development of the children as well as the general well being of the population. School attendance in the region is very poor and is attributed partly to lack of community and international support.

Effects on livelihood strategies: Pastoralists irrespective of their wealth group purchase most of their food needs. Currently the purchasing power has greatly reduced and food prices have increased. The price of milk a key food for pastoralists has increased by over 70%. Camel milk that used to cost \$0.3 per litre according to baseline is now costing \$ 1.13.

Table 2 Comparison of Livelihood strategies adopted in the region

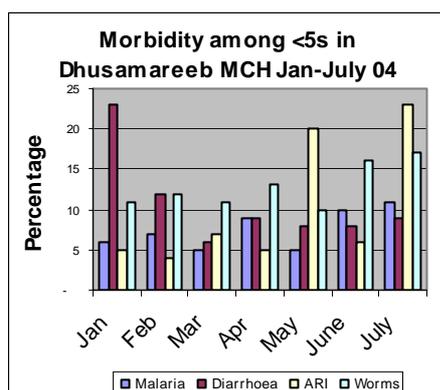
2003	2004
<ul style="list-style-type: none"> • Sale more animal with less price • Increase sale of milk rather the consumption • Increase in credit • More migration to better places • light community support credit and remittance 	<ul style="list-style-type: none"> • Strong community support (Remittance & credit) • Water trucking • Increase of radio calls for seeking support (local and abroad • Camel slaughter for meat purpose to survive • Burning shrubs and crushing to feed shoots

Table 2 above compares livelihood strategies applied in 2003 and 2004, while table 4 compares food access during a normal situation and the current situation.

Table 3 Food access of normal situation, (baseline) compared with current

	Normal	Current
Own production (milk, meat and wild food)	17%	Decreased(0)
Staple purchase	59%	Increased (65%)
Non staple purchase	34%	Decreased (17%)
Gifts	0	Increased 3 %
Total food	110%	85 % (deficit 25%)
Income	Normal	Current
Livestock and livestock product sale	38%	Decrease 100%
Self-employment	31%	Increase of availability and decline of price resulted, decline of 15% (26%)
Loan(borrowing)	13%	Increased (26%)
Employment	7%	Reduced (2%)
Gifts in cash local and abroad remittances	13%	(26%)
Total income	102%	80 % (less access of income 22%)

2.3. Health



Currently, both the urban and rural populations are served by three MCH centres run by SRCS, one in Dhusamareeb and two in Adaado district. There are two community based health centres in Guriel and Adaado which also provide some basic health care and referral emergency services including minor surgery. Somali Association of Health Care and Education/Development (SAHCED) a local Community Based Organisation supported by diaspora currently operates in Dhusamareeb and is involved in out patient services. The organization has rehabilitated Dhusamareeb health centre mainly the out patient departments and laboratory.

The patients are charged consultation fees of 5000 Somali Shillings (0.4 USD) with the exception of under five children, TB patients and patients

who are

extremely poor. SAHCED also provides outreach services in the surrounding main villages like Mareergur, Gudinable, Gadoon and Baxdo.

Source: SRCS health facility records

There are also around 12 pharmacies in both areas of Adaado and Dhusamareeb that provide some basic health services mainly to the town residents. Most of the villages have no health facilities except Guriel (a large populated village), the rest of the villages have limited access to health care with most of people travelling 20-45 Km to the nearest health facility.

Common diseases affecting children include: Malaria, ARI, Diarrhoea and Intestinal parasites as shown on the chart.

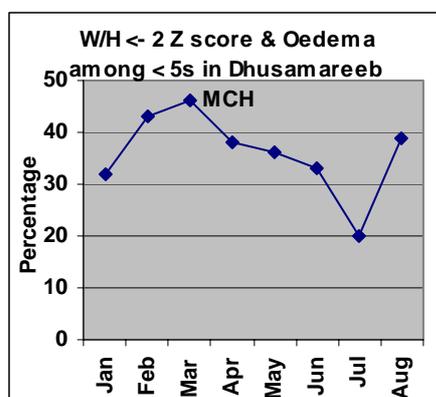
2.4 Water and environmental sanitation

The main water sources are berkads, shallow wells, boreholes and balleys. During the dry periods, the berkads play a vital role for the water needs. Currently, most of the berkads have dried up. Both districts are served by 8 drilled boreholes, five in Dhusamareeb, and three in Adaado district and about 20 shallow wells, Most of these wells are open. In terms of water accessibility in some areas people have to travel an average of 30 kms to access water both for livestock and household consumption. Sanitation practices are poor with some families disposing waste matter on open ground or in bushes.

2.5 Humanitarian operations

The only international agency operating in the area is ICRC supporting water trucking activities and rehabilitation of boreholes. With support from UNICEF Somali Red Crescent Society (SRCS) operates MCH centres in Adaado and Dhusmareeb districts. Somali Association of Health Care and Education Development (SAHCED) has been active in the region since 2000. CARE and concern CONCERN have also conducted humanitarian assessments in the area.

1.6 Nutrition Situation



No nutrition survey has been conducted in the area; however trends in malnutrition based on child growth monitoring data from health facilities between January and July 04 has persistently shown high malnutrition rates of over 20% (WFH <-2 Z score or oedema). On average a total of 196 children are weighed on monthly basis.

similarly a rapid nutrition assessment carried out in July 04 in 11 villages of the two districts thought to be of food insecurity concern indicated high levels of acute malnutrition (MUAC <12.5 cm) of 32% and 28% in Dhusamareeb and Adaado respectively. Retrospective under five and crude mortality rate indicated an emergency situation.

2 METHODOLOGY

3.1. Survey Design

The survey collected both quantitative and qualitative data. Cross-sectional data was collected through a standard household nutrition questionnaire (see appendix 1) Retrospective mortality data for the last 90 days was collected concurrently among the study households using a questionnaire attached in the appendix 2. In order to provide a deeper understanding of the underlying causes of malnutrition, qualitative data were collected through focus group discussions, key informant interviews, observation and secondary data review from recent reports

3.2 The sampling procedure

A two-stage cluster sampling methodology was used in which 30 clusters were randomly selected based on population proportional to size basis. A sampling frame was constructed by listing all villages within Dhusamareeb and Adaado districts with their respective cumulative population figures. The population estimate figures were obtained from WHO (NIDs 2004) and further verified for validity by the survey team.

An estimated population of 79,245 was used from which a cluster interval was determined by dividing the total population by 30. The calculated cluster interval was 2642. A random number 1927 within the cluster interval was selected from currency serial numbers on a bunch of Somali shillings notes and used to determine the first cluster. The next and subsequent clusters were determined systematically by adding the cluster interval 2642 to the first randomly selected number until the 30 clusters were identified (appendix 3). From the 30 randomly selected clusters, a total of 930 children between the heights/length of 65 and 110cm and 6-59 months old were randomly surveyed. However, insufficient information on some children and extreme measurements led to the dropping off of 2 children during analysis, thus only 928 were included in the analysis. At the time of the survey the security situation in the assessed areas was relatively calm except in the northern part of Galinsoor in Adaado district. In Cali Hassan the team found only a few children due to population migrating and had to complete the required number in Bohol a neighbouring village inhabited by populations with the similar characteristics. The same also happened in Dhagaxyaale village and the remaining children were completed in Diriye Hassan while Docoley village was replaced with Gidays because of clan conflict at the time of the survey.

The same sampling frame was used in cluster selection for mortality assessment; hence the same 30 clusters selected for the nutrition data were used for the mortality data collection. Mortality questionnaires were administered to 30 randomly selected households per each cluster irrespective of whether with under-five or not. In total, mortality data was collected from 900 households.

3.2.1 Study population and sampling criteria

The study population consisted of people living in the Dhusamareeb and Adaado districts and comprised 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. 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, 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 cluster with similar characteristics 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 the survey. If a child was in a relative or neighbour's house, the child could be called and assessed.

With regard to measuring nutrition status of adults, Mid Upper Arm Circumference (MUAC) of mothers(15-49 years) or caregivers (if mother was not present) of the selected children was measured.

The mortality data was collected retrospectively with the first questionnaire being administered on the first randomly selected household irrespective of presence of an under-five child or not. Same direction (which has been randomly picked by spinning a pen) as indicated above was followed unlike the survey for children where only households with children were visited for interview, the mortality questionnaire was exercised in every household in the identified direction. The survey team turned to the right side on reaching the cluster edge,

until 30 households were surveyed from the cluster. If a cluster was exhausted of households before the required 30 households a neighbouring cluster with similar characteristics was randomly selected and the team continued to administer the questionnaires until the required number of households was reached.

3.3 Data collection

3.3.1 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 children would be lightly dressed before having the weight taken. 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.

3.3.2 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).

3.3.3 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.

3.3.4 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.

3.3.5 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 there was under-five 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 900 households with and with no under-five child 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.

3.3.6 Dietary Diversity

Dietary diversity was determined by taking a simple count of various food groups consumed in a given household over the past twenty four hours. Additionally, the sources and frequency that given members of the household (less than five or over five year olds) consumed certain food groups was also determined. The food groups considered were Cereals/staples; Beans and other pulses; Dairy and dairy products (milk); Fats/oil/Ghee; Sugars in tea and others; Meat and meat products; Eggs; Fish and sea food; Roots and tubers; Fruits; Vegetables and Beverages, spices & other products

3.3.7 Adult Nutritional Status

Adult nutritional status was determined among mothers or care giver (in absence of the mother in households) surveyed by measuring MUAC on the left hand side to the nearest 0.1cm. .

3.3.8 Vitamin A Deficiency

Vitamin A deficiency (VAD) was assessed by determining if any members of a household suffered from night blindness.

3.3.9 Consumption Coping Strategies

Consumption coping strategy was determined and calculated as per The Coping Strategies Index Field methods

manual by CARE and WFP. Respondents were asked to identify how many times a given coping strategy had been in the past 30 days prior to survey.

3.4. Qualitative data

Qualitative data on issues influencing nutrition was collected through focus group discussions, key informants and observations and literature review.

3.5 Description of survey activities

Table 4: Chronology of activities for survey

Major Activity	Dates. 2004
Discussion with partners in Nairobi and field level	20-26 th August
Preparation of tools, methodology & review of secondary data Nairobi and field level	31 st August – 9 th September
Training of enumerators and pre-testing	15 th – 17 th September
Cluster Identification	17 th June
Data collection	18 th – 22 nd September
Data entry	19 th – 23 rd September
Data cleaning & preliminary analysis	24 th – 26 th September
Presentation of preliminary results	27 th September
Circulation of draft report for comments	11 th October
Circulation of final report	20 th October

Six teams participated in the survey. Each team consisted of two enumerators and one supervisor with each team managing one cluster in a day. Supervisors were from the participating partners namely; SRCS, UNICEF and FSAU. The enumerators were from SRCS selected on the basis of their experience and ability to understand and collect data. Each team was accompanied by an elder from the respective villages/clusters who assisted in identification of the cluster and its centre. The overall planning, management, funding, training, supervision, data collection, entry and analysis and report preparation was provided by two FSAU, Focus group discussions and key informant interviews were conducted by the food security field analysts, a nutritionist and a health professional.

3.6. Quality control procedures

In order to ensure that enumerators and supervisors were able to administer the questionnaires properly, read and record measurements accurately, a rigorous training for the survey team was conducted for three days. The data collection tools were in Somali language. The training covered interview techniques, sampling procedure, inclusion and exclusion criteria, sources of errors while taking of measurements, standardising the questions in the questionnaire, levels of precision required in measurements, diagnosis and verification of oedema and deaths 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 a rural village outside Dhusamareeb town where the training was done. Standardisation involved taking repeated measurement of 10 children from an 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.

Quality of data was also ensured through (i) close monitoring of fieldwork by a FSAU nutritionist and nutrition monitors from UNICEF and FSAU (ii) crosschecking of filled questionnaires on daily basis and (iii) daily review undertaken with the enumerators to address any difficulties encountered, (iv) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights.

3.7 Data analysis

3.7.1 Entry, cleaning, processing and analysis

Data was entered and analysed using EPI-INFO 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).

3.7.2 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.

3.7.3 Creation of nutritional status indices

The anthropometric measurement of weight and height 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

3.SURVEY RESULTS

Due to insecurity in some areas of Adaado district, some of the selected clusters were replaced by other clusters from similar characteristics and thus the survey findings are representative of areas that could be accessed.

4.1 Household characteristics of study population

The nutrition survey covered a total of 928 children from 424 households. The mean household size was 7.8 SD= 4.24 persons while the mean number of under fives per household was 2.1. About 73% of the children came from male headed households while 27% came from female headed households

Table 5 Household characteristics

	N	(%)
<i>Children's residence status</i>		
Those in their usual residential areas	848	91.7
Internally displaced persons/Internal migrants	71	7.5
Returnees	11	1.2
<i>Place of origin :</i>		
Conflict areas	40	49
Within the survey area	37	45
Outside the survey area	5	6
<i>Date of arrival</i>		
<=6 months	42	51.3
7-12 months	24	29.2
> 12 months	16	19.5
<i>Reason for movement</i>		
Conflict/insecurity	33	50.0
Food shortage	16	24.2
Water shortage	10	15.2
Lack of Jobs	7	10.6

Majority of the children (91.7%) of the surveyed children came from households who were in their usual areas of residence, while about 9% had come from households that have been internally displaced or returnees. For those not in their usual area of residence 49% came from areas of clan conflicts mainly Elbur and Harale. The others came from within the area 45% while the rest 6% came from outside the area. About 50% had come to the area 6 or more months ago; about 30% between 7-12 months ago while less than a quarter had come to

the area more than a year ago. The main reasons for movement were conflicts about 50%, food shortage 24.2% water 15.2% and lack of jobs 10.6%.

4.2 Migration practices of the study population

Table 6 Migration practices of households

	N	%
Those who migrate regularly with livestock		
Yes	375	42.3
NO	511	57.7
When members migrated last with livestock		
Before September 03	4	1.0
Sept-December 03	11	2.9
January-September 04	360	96
Where members migrated to		
Within the area	202	53.9
Outside the area	173	46.1
Have those who migrated returned		
Yes	81	21.6
No	294	78.4
Mode of livestock transportation		
Truck	39	10.4
Hoof	336	89.6
If by truck mode of payment		
Cash	10	25.6
Debt	24	61.5
Livestock exchange	5	12.9

About 42% of the children came from households who regularly migrate while about 58% came from households who do not migrate regularly. For those who migrate regularly, 96% had migrated within the last 9 months while about 4% had migrated more than a year ago. More than half about 54% of the children came from households that had migrated to areas within the region while about 46% had migrated outside the region. Only less than a quarter about 22% had returned to their usual areas while the majority about 78% had not yet returned. The main mode of transportation for livestock was by hoof about 90% with only about 10% having used trucks for transportation of the livestock. For those who used truck for transportation of livestock the mode of payment was mainly through debt about 62% while the rest paid through cash 26% and livestock exchange about 13%

4.3. Livelihood, Assets Ownership and Coping Strategies

Table 7: Distribution of children by means households' livelihood, Assets Ownership and consumption coping strategies

Livelihood means	N	%
Self employment/Petty trade	384	42.0
Pastoral	364	39.9
Casual labour	104	11.4
No specific livelihood	61	6.7
Assets Ownership		
<i>Shoats ownership 3 years ago</i>		
1-45	150	16.1
50-300	473	50.1
>300	63	6.7
None	333	35.8
<i>Shoats ownership at present</i>		
1-45	471	50.8
50-300	200	21.5
>300	0	0
None	301	32.5
<i>Camels ownership 3 years ago</i>		
1-50	277	30
>50 to 200	21	12.1
None	630	67.9
<i>Camels ownership at present</i>		
1-50	243	25.7
>50 to 200	1	0.1
None	685	74
Consumption coping strategies		
- Switch from high quality to low quality less expensive foods	673	73.2
- Borrow food or rely on help from relatives	307	33.2
- Purchase food on credit	297	32.4
- Gather wild food or hunt	33	3.6
- Sell livestock at give-away price to buy staples?	252	27.2
- Send household members to eat elsewhere?	148	16.0
-begging	119	13.1
- Limit portion size at mealtimes	526	57.7
- Restrict consumption of adults in order for small children to eat	409	44.5
- Feeding working household members	91	9.9
- Reduce number of meals eaten in a day	261	29
- Skip entire days without eating	178	19.4
- Deplete assets to get food, i.e. sell livestock, land, jewellery, etc)	97	10.5

About 40% of the children came from households who were either self employed or engaged in petty trade as the main source of livelihood, pastoralism about 40%, casual work 11.4% and no specific livelihood 6.7%. Half of the children came from households that had 50-300 shoats three years ago while about 16% came from households that owned between 1-45 shoats. Presently the ownership of shoats 50-300 has reduced to 21.5%. About 6.7% owned more than 300 shoats three years ago while at the time of the survey no one from the surveyed households had over 300 shoats.. Similarly about 30% of the children came from households who owned 1-50 camels three years ago. Presently about 26% of the children came from households who own 1-50 camels. All children came from households who reported to have employed at least one or more of the consumption coping strategies in the last 30 days prior to the survey. The most commonly used were switching to low quality less expensive food every day of the week 73%, limiting of

portion size at meal times 57.7%, restrict consumption of adults in order for children to eat about 45%, borrow/rely on help from relatives 33%, purchase food on credit 32.4% and sell livestock at throw away price about 27%.

4.4 Water access, sanitation and hygiene

Table 8: Water access, sanitation and health seeking behaviour

Water access	N	(%)
<i>Main source of drinking water</i>		
Boreholes	601	65.0
Catchments	61	6.6
Unprotected well/spring	246	26.7
Public tap	11	1.2
Protected spring/well	5	0.5
<i>Main source of cooking water and personal hygiene :</i>		
Boreholes	584	64.2
Rain water from catchments or ponds	59	6.5
Unprotected well/spring	231	25.4
Protected spring/well	16	1.8
Public tap	19	2.1
<i>Distance to the nearest water point:</i>		
0 – 500 metres	69	9.0
501 – 1000 metres	70	9.1
1001 – 5000 metres	74	9.7
>5000 metres	554	72.2
<i>Amount of water used in the household per day</i>		
> 15 litres	747	81
11-15 litres	100	10.8
6-10 litres	56	6.1
less than 6 litres	19	2.1
Sanitation and hygiene		
<i>Sanitation facility</i>		
Improved/ventilated pit latrine	26	2.8
Traditional pit latrine	455	49.7
Bush/open grounds	435	47.5
<i>Wash hands before eating or food preparation:</i>		
Always	576	63.8
Often	184	20.4
Sometimes	56	6.2
Hardly rarely	86	9.6

About two-thirds of the children (65%) came from households who were obtaining drinking water from boreholes, while about 27% were obtaining from unprotected well/spring.

Similar proportions of children came from households obtaining water for cooking and personal hygiene from the same sources. The majority 72% were travelling over 5 km to get water.

The majority of the children 81% came from households who are using more than 15 litres of water daily. Collectively, over half of the children (53%) were from households using either improved pit latrine or a traditional pit latrine. About 63% of the children came from households which always wash hands before eating or food preparation, about 20% wash often while 6% wash sometimes and 9.6% hardly wash hands

before eating or cooking.

4.5 Health seeking behaviour

Table 9 Health seeking behaviour

	N	%
<i>Seek healthcare assistance when child is sick:</i>		
Yes	764	82.2
No	165	17.8
<i>Reason</i>		
No health facility in near distance	56	33.9
No money	109	66.1
<i>Where :</i>		
Traditional healer	74	9.7
Private clinic/pharmacy	546	71.5
Public health facility	144	18.8

Majority of the children (about 82%) were taken for health care assistance when sick while only about 18% of the children were not taken for health care assistance. Those taken for health care assistance are taken to private clinic/pharmacy 72%, about 19% to public health facility and about 10% to traditional healer. Reasons given for not taking child for health care were lack of access

to health facility about 34% and lack of money 66%

4.6 Characteristics of study children

Of the 928 children surveyed, 58% were boys and 42% were girls. The 928 children came from the 424 households surveyed.

Table 10. Distribution of children according to age and sex

	Boys		Girls		Total	
	N	%	n	%	N	%
6-11 months	53	60	35	40%	88	9.5
12-23 months	121	61.1	77	38.6	198	21.3
24-35 months	91	50.8	88	49.2	179	19.3
36-47 months	127	57.7	93	42.3	220	23.7
48-59 months	148	60.9	95	39.1	243	26.2
Total	540	58	388	42	928	100

4.7 Nutritional status of survey children using anthropometry

Table 11. Summary of Global Acute malnutrition and Severe Acute Malnutrition

Malnutrition Rates	Proportion	No.
Global Acute Malnutrition (<-2 Z score or oedema)	20.5 (CI 18.0-23.3)	191
Severe Acute Malnutrition (<-3 Z score or oedema)	2.5 (CI 1.6-3.7)	23

Table 11 indicates that global acute malnutrition defined as W/H Z score (<-2 z-scores or oedema) was 20.5 % while severe acute malnutrition (<-3 z-score or oedema) was 2.5%. There were no oedema cases identified.

Table 12: Distribution of children by nutritional status (weight/ height z-score or oedema) and child sex

Nutrition status categories	Males		Females		Total	
	Proportion	No.	Proportion	No.	Proportion	No.
Global acute malnutrition (W/H <-2 z score/oedema)	22.4% (CI 18.7-26.3)	121	18% (CI 14.0-22.3)	70	20.5% (CI 18.0-23.3)	191
Severe acute malnutrition (W/H <-3 z score/oedema)	2.4% (CI 1.3- 4.4)	13	2.5% (CI 1.5-5.4)	10	2.5% (CI 1.6-3.7)	23
Oedema	0	0	0	0	0	0

Overall 22.4% of the boys were malnourished compared to girls.18%. There was no significant difference in the malnutrition rate between boys and girls indicating no peculiar aspects of increased vulnerability for any sex at household level

On table 13 below the nutritional status of the surveyed children is presented according to their age groups. The results show that severe acute malnutrition was highest among children under 24 months (4.8%) as compared to children 24- 59 months (1.4%)

Table 13: 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 and no oedema)
6-11 months	3(3.4 %)	12(13.6%)	15(17%)	73(9.9)
12-23 months	11(5.5 %)	30(15.2%)	41(21%)	157(21.3%)
24-35 months	1(0.5 %)	29(16.2%)	30(16.7%)	149(20.2%)
36-47 months	3(1.3%)	46(20.9%)	49(22%)	171(23.2)
48-59 months	5(2.0%)	51(21.0%)	59(24%)	187(25.3)
Total	23(2.4%)	168(18.1)	191(20.5)	737(79.6%)

As shown on table 14 below the global acute malnutrition among children aged 6 - 59 months based on weight for height <80% of median or presence of oedema was 11.9% while the severe acute malnutrition <70% of median or presence of oedema was 0.7%. No cases of oedema were identified.

Table 14 Malnutrition prevalence using W/H percentage of median categories(Confidence intervals- missing)

Nutrition status categories	Males		Females		Total	
	Proportion	No.	Proportion	No.	Proportion	No.
Global acute malnutrition (W/H<80% or oedema)	12.7 (CI 10.8-17)	69	10.8 (CI 9.2-16.4)	42	11.9 (CI 11-15.7)	111
Severe acute malnutrition (W/H<70% or oedema)	0.5 (CI 0.1-1.6)	3	1.1% (CI 0.4-3.1)	4	0.7 (CI 0.3-1.6)	7

4.8. Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

Table 15 Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

	Number	%
<i>Incidence of major child illnesses</i>		
ARI	359	38.6
Diarrhoea within two weeks prior to survey	364	39.1
Malaria within two weeks prior to survey	90	9.7
Measles within one month prior to the survey	116	12.5
<i>Measles immunisation</i>		
Children receiving measles vaccination (9 - 11 months) (N=32)	13	40.6
Children receiving measles vaccination (12- 23 months) (N=197)	82	41.6
Children receiving measles vaccination (9 - 59 months) (N= 871)	222	34.6
Verification for those vaccinated by card	60	6.8
<i>Children who have ever received Polio dose</i>		
One to two times	188	20.3
Three times	326	35.1
None	414	44.6
<i>Vitamin A supplementation</i>		
Children receiving Vitamin A supplementation in past 6 months	304	32.8

The survey showed a relatively high prevalence of diarrhoea and ARI. During the past two weeks before the survey, about 38% of the assessed children had ARI, 39% diarrhoea, 12.5%, measles and 9.7% suspected malaria. The overall measles vaccination among the various age groups was generally low. Results indicate that less than half 40.6% of the children aged 9-11 months were immunised against measles, age 12- 24 months, 41.6% while coverage for children aged 9-59 months was 34.6%. Only about 7% of the coverage could be verified by card. Less than a quarter 20% had received one dose of polio, 35% three doses while about 44% had not received any dose. Vitamin

A supplementation was low with only 32% of the surveyed children having received vitamin A supplementation in the past 6 months prior to the survey.

4.9 Feeding practices

Table 16: Children feeding practices

	N	(%)
<i>Are you breastfeeding child (age 6-23 months)</i>		
Yes	65	22.7
No	221	77.3
<i>Age when child stopped breastfeeding</i> 0 - 5 months	66	30
6 - 11 months	102	46
12 months or more	53	24
<i>Weaning age (age 6-23 months)</i>		
0 - 3 months		
4 - 6 months	196	68.5
7 months or more	38	13.3
	52	18.2
<i>Feeding frequency (6-23 months)</i>		
Once	38	13.3
2 times	128	44.7
3 times	94	32.9
4 or more times	26	9.1

At the time of the survey, less than a quarter about 23% of the children aged between 6-24 months was breastfeeding. Of those who had been stopped from breastfeeding, 30% had stopped before six months, 46% before the first year and 24% after the first year. 81% of the children were introduced to food other than breast milk between the time of birth and six months.

58% of the children were fed between 1-2 times per day about 33% three times and only about 9% were fed more

than four times a day.

4.10 Dietary diversity among children

Table 16: Distribution of food groups consumed by children under five years

No of food groups consumed	N	%
<=2 food groups	108	11.6
3 food groups	406	43.7
>4 food groups	416	44.7

Table 16 above indicate that more than half of the children (55.3%) had consumed three or less food groups within 24 hours prior to the survey. About 44% had consumed 4 or more food groups within the same period. The range of food groups consumed was 1 – 9. The most consumed food was cereals, consumed by 99.1% of the children, sugars 92.3% and fats 86.7%. Milk (including breast milk) was consumed by 60.3% of the children, meat by 22.1% and beans by 64.4%. The least consumed foods were fruit 4.6% and vegetables 14.1%. For the commonly consumed foods (cereals, sugar and fat) the main source was mainly borrowing. About 67% of the children came from households who reported that they had borrowed the cereal, about 60% had borrowed sugar and about 53% had borrowed fat. There was statistically significant relationship between malnutrition and the number of food groups consumed in the previous 24 hours with the children consuming few food groups being at higher risk of malnutrition than those consuming more food groups in the meals ($p=0.018$).

4.11 Adult Women Malnutrition

Malnutrition rates among adults were investigated using mid upper arm circumference (MUAC) measurements of women of child bearing age (15 – 49 years).

Table 17: Nutrition status of women 15-49 years

Nutritional status of women 15- 49 year		N	%
Pregnant women	Severe risk MUAC < 20.7 cm	7	7.9
	Moderate risk MUAC <= 20.7 and < 23 cm	20	22.5
None pregnant women	Severe MUAC < 16 cm	14	1.8
	Moderate MUAC >= 16 and < 18.5 cm	13	1.7

The survey findings indicate that pregnant women were more malnourished than non-pregnant women. About 7.9% of the children came from households where pregnant women (either mothers or caretakers) were severely malnourished while 22.5% were moderately

malnourished (n=89). Malnutrition levels for non pregnant was low. About 2% (n=760) of the children came from households where non pregnant women were malnourished.

4.12 Vitamin A deficiency

Table 18 Vitamin A deficiency

	N	%
<i>Night blindness)</i>		
Yes	52	6.0
No		
<i>Persons vitamin A deficiency (n=52)</i>		
Below 5yrs	14	26.7
Above 5 yrs	38	77.3

Overall the prevalence of Vitamin A deficiency (VAD) was 6% as assessed by way of night blindness. Of the vitamin A deficient cases, about 27% were under fives while the rest 73% were above five years of age.

4.13 Mortality rates

A total of 900 households were surveyed for mortality indicator with a recall period of 90 days prior to the survey being used. The results were as presented below:

Mortality rates;

For children aged 0-59 months (under-five mortality rate)

Under five population in surveyed households 1483

Number of under five deaths = 32

Under five mortality rate = 2.39 deaths per 10,000 children per day

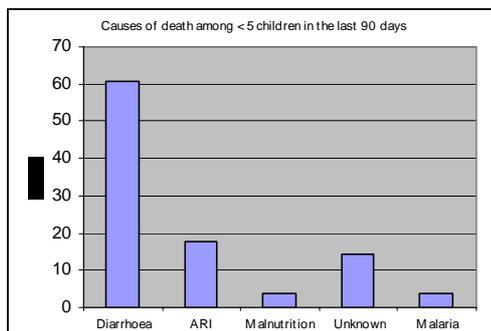
For the total population (Crude mortality rate)

Total population in surveyed households = 5639

Total number of deaths in the households = 57

CMR = 1.66 deaths per 10,000 persons per day

As shown on the chart below diarrhoeal diseases were the main cause of under-five mortality 60.7% followed by ARI 17.9%. Others included malnutrition, malaria and unknown causes.



Among the persons over five years, the main causes of death were diarrhoea 30%, pneumonia 40% and acidity 15%.

4.14 Relationship between malnutrition and other factors

Table 19 Risk factors and relation to total malnutrition

Exposure variable	N	(%)	Crude RR	95% CI	p-value
Child sex:					
Male	121	22.4	0.94	0.88-1.07	0.08
Female	70	17.9			
Age group:					
6-23	56	19.6	1.02	0.95- 1.09	0.64
24-59	135	21			
Diarrhoea:					
Yes	85	30.4	0.94	0.88- 1.01	0.08
No	106	23.0			
Measles:					
Yes	27	30.4	0.96	0.86-1.07	0.43
No	164	25.2			
Vitamin A:					
Yes	63	26.1	1	0.93-1.07	0.9
No	128	25.8			
ARI					
Yes	84	30.5	0.94	0.88-1.01	0.08
No	107	23.0			
Dietary diversity					
<= 2 food groups	32	29.6	0.87	0.35-0.92	0.018
>= 3 food groups	159	19.3			

The survey findings as indicated in table 19 above reveals no statistically significant association between malnutrition rate and child sex, age group, morbidity, vitamin A supplementation immunisation, weaning age except dietary diversity (P = 0.018)

4.15 Qualitative information

Qualitative information was derived from focus group discussions, key informants and review of reports. The discussions were centred on feeding and care practices, health care, food security, water and sanitation issues. A total of 8 focus group discussions (FGDs) on health, care and feeding practices were conducted, four of men and four of women each consisting of 7-16 people. They were conducted in Mareeregur, Eldhere, Gudinalable, Guriceel, Dhusamareeb and Gadoon.. While a total of 10 FGDs on food security were held in the same villages, 6 in the Dhusamreeb and 4 in Adaado.

Care and feeding practices

Cultural factors greatly influence breast feeding practices. New born babies are first given water and sugar immediately after delivery and start breast feeding 1-2 days after delivery. Reasons given during the focus group discussions for not

starting breastfeeding immediately was that the mother has no milk, the baby does not have the strength to suckle and the mother has abdominal pains. Goats, cows or camel milk and sometimes porridge were introduced within the first three months. The mothers also indicated that breast feeding was stopped if the mother got pregnant.

The focus group discussions reported that mothers in the rural areas continue breastfeeding for a longer period, about

two years compared to mothers in the urban centres who normally stop by six months.

Common foods normally fed to children below 3 years include *Anjera* (Somali pancake), rice and beans three times per day in combination with tea or milk added. At the moment children were being fed 1-2 times per day mainly with cereals, fat and sugar and the quantity was reported to have also reduced.

There has been change in family food consumption in the last three months due to asset depletion and reduced income options. Most of the mothers mentioned that they have switched to cheaper foods (e.g. reduction of milk and meat in the diets). It was also noted that due to the reduced numbers of livestock majority had no access to milk, which usually is a key food for children. Hence children from poor families were being fed mainly on sorghum or maize porridge and occasionally rice or *Anjera* while at normal times, milk is usually

added to these foods.

Mothers mentioned that they withheld certain foods when children were suffering from some infections. Cows /goat milk or fatty foods are avoided when children get measles. Mothers believe that these foods will increase vomiting and thus the child will die. Similarly semi-solid foods or fresh milk is also avoided for children with diarrhoea.

Although more than half of children were consuming 3 or more food groups per day, the foods are mainly cereals, fat and sugar with less people consuming beans, meat, dairy products, fruits and vegetables thus limiting access to essential nutrients like proteins and micronutrients. The results further indicate difficult ties in accessing food as the majority reported borrowing as the main source of the common foods consumed.

About 67% of the children came from households who reported that they had borrowed the cereal, about 60% had borrowed sugar and about 53% had borrowed fat.

Water and environmental sanitation

The main sources of water are berkads, hand dug wells and few bore-holes. The few functioning wells are in poor condition due to a lack of appropriate maintenance. The distance between water points and settled villages is very far ranging between 20-45 kms. In some of the areas where water is accessible the focus groups reported that waiting time was between 2-4 hours. Access to water is currently a serious problem due to a limited number of water sources, their overuse and in some areas due to conflicts. . The pastoralists have set up temporary plastic water reservoirs filled through water trucking for both livestock and humans. Average normal price of water for the remote area is \$ 0.4 while current average price per drum of 200 litres reached between \$ 2.2. Due to successive seasons of rain failure all Berkads dried up earlier than normal, while water in the wells has declined due to the lowering of the water table. Private and ICRC are involved in water trucking although the demand is still very high. as the majority of pastoralists have to rely on water trucking to access water for households and animals. People in the focus groups reported to access an average 15-20 litre of water per household/day. In most of the visited areas, solid waste disposal practices at both house hold levels and public places were poor.

Food security

The team witnessed manifestations of severe food insecurity. The failure of the four seasons exacerbated the already weakened livelihood strategies resulting a poor pasture, limited water availability, massive livestock deaths, environmental degradation and increased number of destitute. According to information gathered through focus group discussions, an estimated of 80% of cattle, 45% of shoats and 30% of camels have been lost either through sale or death in a period of three years of drought. The general body conditions of the livestock in the assessed areas were poor and weak. The main asset of wealth determinant in the region is livestock holding. According to focus group discussions half of the better off have fallen in to the middle category, half of middle wealth groups have switched to poor wealth group while two thirds of the poor pastoralists have become either very poor with few weak animals or destitute people without any means of livelihood relying on social support.. The survey team observed a significant number of destitute people in major villages, water points and urban Centres. Cattle and camel milk is completely unavailable in the market and has been replaced by consumption of powder milk, a strange phenomenon among the better off.

Health related issues

The most common diseases among children reported at the time of the survey were ARI, diarrhoea and malaria. There were also reports of some cases of measles. . Additionally the focus group discussions revealed that residents of some of the villages have to travel an average of 30 kms to reach the nearest health facility.

Common diseases in adults include: Anaemia, common cold, malaria and Pulmonary TB. Some of the villages have trained community workers and traditional birth attendants.

The focus group discussions further revealed that the residents sought medical care for children only when the child got worse and home remedies had failed. It was also noted from the focus group discussions that the very poor households could not afford medical care.

3 DISCUSSION

Nutritional status

The global/total acute malnutrition rate was 20.5 % (CI 18.0-23.3) with a severe acute malnutrition rate of 2.5 % (CI 1.6-3.7). This is within critical levels according to WHO classifications. The results showed that severe acute malnutrition was highest among children under 24 months (4.8%) as compared to children 24- 59 months (1.4%) However there was no statistically significant association between age group and nutritional status Further analysis showed no relationship between risk factors such as morbidity, low vitamin A supplementation, low measles coverage and breast feeding and malnutrition. This critical level of malnutrition could therefore be attributed to the current severe food insecurity/ feeding practices. A statistically significant relationship between malnutrition and the number of food groups consumed in the previous 24 hours with the children consuming few food groups being at higher risk of malnutrition than those consuming more food groups in the meals ($p=0.018$) was noted.

The level of adult malnutrition was also high among pregnant women with those at severe risk being 7.9% and those at moderate risk 22.9%. This could be associated to the strenuous life currently being experienced by women in the area with no adequate food, water and high indebtedness as revealed by the survey. Mortality results show that the under five mortality was 2.39 deaths per 10,000 persons per day while crude mortality rate was 1.66 deaths per 10,000 persons per day indicating an alert situation. The mortality rates show an alert situation that needs close monitoring. Vitamin A deficiency (VAD) prevalence measured through night blindness investigation was also found to be relatively high (7.3 %.) The prevalence was higher in persons over five years 73% compared to children less than five years 27%. This could be attributed to low consumption of vitamin a rich foods as well as the poor vitamin A supplementation coverage noted in the survey.

Food security situation: Livelihood means, Assets ownership and Coping mechanisms

The area is currently experiencing severe food insecurity attributed to drought that is in its third year and frequent inter- can conflicts that have continued to interrupt the livelihoods. Surrounding areas in Northern Somalia and Ethiopia are also facing severe drought thus limiting options for alternative pasture and water. Qualitative information from focus groups indicate that the prolonged drought has caused significant livestock losses as a result of deaths and distress sale. Cumulatively for three years, about 45% of the shoats, 30% of the camels including pack animals and about 80% cattle have been lost. This was further confirmed by the survey findings, of the 50% of the households who owned 50-300 shoats three years ago, only 20% own that number and no house hold in the surveyed area own more than 300 shoats while three years ago about 7% owned more than 300 shoats. Further, the survey results showed that average shoats owned three years ago had reduced from 99 to 26 per household.

Qualitative data indicate a shift in wealth group with half of the better off shifting to the middle category, half of the middle wealth groups shifting to the poor wealth group and two thirds of the poor pastoralists divided into very poor and others becoming destitute. Although pastoralism is the main livelihood, survey findings indicate that only about 40% reported to be pastoralists the rest about 42% were involved with petty trade or self employment and about 18% had no particular livelihood. High level of indebtedness was also reported by traders and from the focus group discussions. This was further confirmed by the survey results that showed that of those who migrated with livestock and used truck for transportation the mode of payment was about 60%, through debt, 27% paid cash and 13.5% used livestock exchange.

The remaining livestock for all species are extremely weak and in poor body condition. Access to milk is extremely difficult due to the reduced number of livestock and low purchasing power. Consumption of powder milk was noted, a strange phenomena especially among the better off. The visible carcass of animal death was enough indication or proof for the high mortality rate of livestock and asset depletion of pastoral community.

At the time of the survey, it was revealed that there was further reduction in the number of meals among the children from the usual 3-4 to 1-2 per day in several households as a way of coping. Other coping strategies employed were (i) switching to low quality food (e.g. reduction in consumption of milk) 73%, (ii) limiting of portion size 60%, (iii) borrowing from relatives 33% and (iv) purchase on credit 32%.

Remittances both from Diaspora and locally has played a key role in survival especially for the poor pastoralists and destitute who lost their animals including pack animals.

Health issues influencing nutritional status

The prevalence of common infections among children within two weeks prior to the survey was high with diarrhoea at 39.1 %, ARI 38.6%, measles 12.5% and malaria 9.7%. Repeated episodes of infections such as diarrhoea are associated with poor nutrient absorption and considerable nutrient losses. The resulting nutritional deficiency causes impaired immunity and increased vulnerability to more infection resulting in a vicious cycle of infection and malnutrition.

Although the majority of the children about 82% were taken for health care assistance when sick, focus group discussions further revealed that the residents sought medical care for children only when the child got worse and home remedies had failed. Late treatment of diseases places the child at increased nutritional risk by prolonging the diseases. The late presentation of children for treatment is attributed to poor access to health services by 31% and lack of money by 69%. Those taken for health care assistance are taken to private clinic/pharmacy 71%, 19% to public health facility and 9.5% to traditional healer. Reasons given for not taking child for health care were no access to health facility about 31% and lack of money 69%.

Water and Sanitation

Currently access to water remains a serious problem in the surveyed area. Over 50% of the children came from households who were obtaining drinking water from boreholes, while about 27% were obtaining from unprotected well/spring and majority over 70% were travelling over 5 kilometres to fetch water. Focus group discussions and observation further revealed that water was being stored in holes lined with plastic sheets for both human and livestock. This was mainly in areas far from the water points and filled by water trucked from the functioning sources. . Due to successive rain failure all Berkads dried up earlier than normal time, while water in the wells has declined due to the reduction of underground water. Private and ICRC supported water trucking is going on in the area the joint effort cannot cover even 10-20% of pastoral water requirement at current situation. The high water prices by the private water trucking limit access to adequate water especially by the poor households. This not only strains the limited income available but also limits the amount of water available for domestic use. Although a high proportion of children came from households using more than 15 liters per day, qualitative information indicate that the majority use 15-20 litres per household per day (1.9 -2.5 litres per person/day) which is below the recommended amount per day

The high prevalence of diarrhoeal diseases among children revealed in the survey is strongly attributed with the reduced availability and consumption of safe water as well as poor personal and food hygiene with a high proportion of the households not washing hands regularly before eating. Only about a third 64% wash hands before eating, thus were increasing the risks of further contamination.

Childcare care and feeding practices

Exclusive breastfeeding, timely 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 breastfeeding at least for the first six months of life. Overall, breast feeding and complementary feeding was found to be sub-optimal. Results of the survey show that a high proportion, around 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 sixth month 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 death from diseases like diarrhoea whose prevalence was found to be high. Additionally, some of the feeding practices such as withholding certain foods when child is sick(as noted in the focus groups) for example milk and fatty foods when child has measles or semi solid food when child has diarrhoea could contribute to further deterioration of the nutritional status. Overall the frequency of feeding was low with about 60% of the children being fed only between 1-2 times per day. Inadequate care for children remains a major underlying factor of malnutrition.

4 CONCLUSIONS AND RECOMMENDATIONS

The findings indicate critical levels of Global acute malnutrition, a situation that is expected to deteriorate further if urgent action is not taken. As a result of the drought, the pastoralists have lost large numbers of their livestock and the remaining livestock are extremely weak and in poor body condition. Access to milk is becoming increasingly difficult due to the reduced number of livestock and low purchasing power. Water remains a critical limiting factor for both livestock and humans thus predisposing the community to water related diseases. Even with a normal Deyr 2004 season, recovery will take time since the pastoralists have lost most of their livestock including pack animals.

Survey findings were discussed with UNICEF and SRCS following the survey and later in Nairobi at a special meeting of the Humanitarian Response Group. The following recommendations were made:

- Increase coverage of water trucking
- Targeted SFP/family ration through the MCHs
- Improve health care such as EPI and curative services
- CARE and WFP are currently exploring ways of supporting food interventions.

7. APPENDICES

Appendix 1. DHUSAMAREEB AND ADAADO NUTRITION SURVEY QUESTIONNAIRE

Date _____ Team Number _____ Cluster Number _____ Name of Supervisor _____
 Name of District _____
 Name of Village/Town _____ Name of section _____ Household Number _____ Name of the household head _____

Q1-14 Characteristics of Household

- Q1** What is the sex of the household head? 1=M, 2=F
Q2 How many people live in this household (Household size)? _____
Q3 How many children are below five years in this household (Number of < 5 years)? _____
Q4 What is your place of permanent settlement (district and village) District: _____ Village: _____
Q4a. What is your present household residence status? 1= residents 2=Internally displaced 3= Returnees 4= internal migration 5=Others specify _____
Q5 Where did you come from before settling in this current location? (Place of origin) _____
Q6 How long have you lived in this current location? _____
Q7 What was your reason for coming to this current location? (Can select more than one option if appropriate): 1= Conflict/ Insecurity 2=Lack of jobs 3= Food shortage 4=Water shortage 5=Pasture Shortage 6=Others; specify _____
Q8 Does any member of the household regularly migrate with livestock? 1=Yes 2=No
Q8a If answer to Q8 is Yes, proceed to question 9
Q8b If ans to Q8 is No, when did this household stop migrating with livestock (month and year) _____
Q8c If ans to Q8 is No, Why did this household stop migrating with livestock (**Rank in order of importance**)
 1= _____ 2= _____ 3= _____
Q9 When did member(s) of this household migrate with livestock last? Month _____ Year _____
Q10 Where did member/members of this household migrate to? _____
Q11 Were there any members of the household left behind? 1=Yes 2= No
Q11a If yes who? 1= Women 2= Children 3= Old people
Q12 Have those who migrated returned with livestock? 1=Yes 2=No
Q13 How did they move their livestock? 1= Truck 2=Hoof
Q14 What is the main livelihood system used by this household? 1= Pastoral 2=Settlement self-employment 3=Petty trade or business 4=Other (specify) _____
Q 15. If trucking how did you pay 1= Cash 2= Debt 3= Exchange livestock 4= Others (Specify) _____

Q16-17 Livestock & Berkad Ownership:

Household	Q16	Q17
Ownership	Present	ThreeYears Ago

Number	Number
--------	--------

1. Shoats
2. Camels
3. Berkads

Q18-28 Morbidity, feeding & immunization status of children aged 6 – 59 months (or 65 – 110cm) in the household.

Sno	Name	Q18 Diarrhoea in last two weeks <i>1= Yes 2= No</i>	Q19 ARI in the last two weeks <i>1=Yes 2=No</i>	Q20 Malaria in the last two weeks <i>1=Yes 2=No</i>	Q21 Measles in last one month <i>1=Yes 2=No</i>	Q22 Vaccinated against measles <i>1=In past six months (by card) 2=In past six months (Recall) 3=Before six months (by card) 4=Before six months (Recall) 5= None</i>	Q23 Vit. A provided in the last 6 months (Show Vit. A capsule) <i>1=Yes 2=No</i>	Q24 Are you breast feeding the child? <i>1=Yes 2=No</i>	Q25 If not breast feeding, how old was the child when you stopped breast-feeding? <i>1= Less than 6 months 2= 6 – 11 months 3=12 – 18 months 4=18 months or more 5= Never breastfed</i>
1									
2									
3									

Q29 When your child is sick, do you seek assistance? 1= Yes 2=No

Q29a If yes where do you seek assistance? 1= Traditional healer 2= Private clinic/Pharmacy 3= Public health facility 4= Other specify _____

Q29b If No, why? _____

Q30 Does any member of this household have difficult seeing at night or in the evening when other people do not? 1= Yes 2= No

Q30a If yes specify member 1= < 5 years 2 = > 5 years

Q31 - 36 Anthropometry for children aged 6 – 59 months (or 65 – 110cm) in the household

SNo	Name	Q31 Sex (F/M)	Q32 Age in months	Q33 Oedema (Yes/No)	Q34 Height (cm)	Q35 Weight (kg)	Q36 MUA C (cm)
1							
2							
3							

(MUAC for adult women of childbearing age (15-49 years))

Q 37 What is the MUAC measurement of the child's mother or care giver? _____cms

Q 38 What is the physiological status of the mother/care giver? 1= Pregnant 2= lactating 3= neither pregnant nor lactating

Q39 Consumption Coping Strategies

In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Relative Frequency				
	All the time? Every day	Pretty often? 3-6 */week	Once in a while? 1-2 */week	Hardly at all? <1 */ week	Never 0*/week
a. Switch from high quality to low quality less expensive foods?					
b. Borrow food, or rely on help from a friend or relative?					
c. Purchase food on credit?					
d. Gather wild food or hunt?					
e. Sell livestock at give-away price to buy staples?					
f. Send household members to eat elsewhere?					
g. Send household members to beg?					
h. Limit portion size at mealtimes?					
i. Restrict consumption of adults in order for small children to eat?					
j. Feed working members of HH at the expense of non-working members					
k. Ration the money you had and buy prepared food?					
l. Reduce number of meals eaten in a day?					
m. Skip entire days without eating?					
n. Deplete assets to get food, i.e. sell livestock, land, jewelry, etc)?					

Q. 40. Food consumption and source of food: How many times did the household members consume the following food items/ food groups yesterday, (morning till evening?). For instance the past 24 hours: consider breakfast, after prayers, lunch, dinner, supper, snacks)	Codes: 0=none 1= once 2= twice 3=3 times 4=4 times 5=5 or more times	Codes: 1=Animal/crop own production 2=Purchases 3=Gifts from friends/families 4=Food aid 6=Borrowed 7=Gathering 8=Others (specify) 9=N/A	5=Bartered
	Type of food	Frequency (<5yrs)	Frequency adults

a) Cereals/staples (rice, wheat, pasta, sorghum, maize)			
b) Beans and other pulses			
c) Dairy and dairy products (milk)			
d) Fats/oil/Ghee			
e) Sugars in tea and others			
f) Meat, fish and eggs			
g) Roots and tubers			
h) Fruits			
i) Vegetables			
j) Beverages, spices & other			
k) Breast milk			
l) Wild foods			
m) Any famine foods (specify)			

Q41-46 Access to water for Human Consumption (quality and quantity)

Q41 Main source of drinking water 1 = piped 2 = public tap 3 = Tube well/borehole 4 = protected well or spring 5 = water catchment 6 = unprotect spring and well 7 = river 8 = other

Q42 Main source of water for cooking and personal hygiene 1 = piped 2 = public tap 3 = Tube well/borehole 4 = protected well or spring 5 = Rain water 6 = unprotect spring and well 7 = other

Q43 Average household water use per day per household for drinking, cooking and personal hygiene is 1 = 0-2 litres 2 = 3 – 5 litres 3 = 6-10 litres 4 = 11-15 litres 5 = more than 15 litres

Q44 Distance to the nearest water point 1 = 0-500 metres 2 = 501 – 1000 metres 3 = 1001 – 5000 metres 4 = more than 5000 metres

Q45 Water and systems are maintained such that quantities of water are available 1 = never 2 = sometimes 3 = almost always 4 = always

Q46 Number of clean water storage containers of 20 litres 1 = 1-2 containers 2 = 3-4 containers 3 = 4-5 containers 4 = more than 5 containers

Q47-50 Sanitation and Hygiene (access and quality)

Q48 Type of toilet used by most members of the household 1 = Improved pit latrine 2 = Traditional pit latrine 3 = Open pit 4 = Bucket 5 = Bush 6 = Other

Q49 Number of people who use the same toilet 1 = 1-5 people 2 = 6-10 people 3 = 11-15 4 = 16 – 20 people 5 = more than 20 people 6 = Not applicable

Q50 Household members wash their hands after defecation 1 = always 2 = often 3 = sometimes 4 = hardly rarely

Q51 Household members wash their hands before eating or food preparation 1 = always 2 = often 3 = sometimes 4 = hardly rarely

Q52 Distance between toilet and water source 1 = 0 – 5 metres 2 = 6 – 10 metres 3 = 11- 20 metres 5 = 21 - 29 metres 5 = 30 metres or more

Appendix 2:

DHUSAMAREEB AND ADAADO 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 live birth between the 20th June 04 and now? Miyaad dhashay ilma nool intii u dhaxaysay 20th Bishii June 04 iyo hadeertada aynu joogno.	Yes..... No..... Haa.....Maya If yes, how many?... Haddii ay haa tahay waa imisa?.....
3. Have you any under five child other than your own in your household coming in since the 20th June 04	Yes..... No..... Haa.....Maya
4. Miyey jiraan wax carruur ah shan sano ka yar oo aadan dhalin oo idiin yimi ilaa	If yes, how many?..... Haddii ay haa tahatay waa imisa.....
5. How many under 5yrs children were living in this household as on the 20th June 04 Imisa carruura oo shan sano ka yar ayaa gurigan ku nool illaa 20th June 04	Number..... Tirada.....
6. How many Under 5yrs children live with you now? Imisa carruur shan sano ka yar ayaa hadda ku nool guriga.	Sons at home..... Imasa wiilal ah Daughters at home Imisaa gabdh ah
7. Do you have any Under 5yrs child who has died since the 20th June 04	Yes.....No.....If yes, then Sons dead
8. Imisa wax carruur shan sano ka yar ayaa kaa dhintay ilaa 20th June 04	Haa.....Maya.....haday jirti imisa wiil.. ama gabdhood baa dhintay..... Daughters dead.....
9. 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..... Imaha kowaad..... Child2..... Imaha Labaad..... Child3..... Imahasadexaad.....

	Child4
ABOVE FIVE YEARS OLD IN THE HOUSEHOLD(Inta ka weyn shan sanadood ee Gurigaan)	
10. How many above five years old were living in this household as on the 20th June 04	Number >5yrs..... Tirada shan sano ka yar.....
11. Imisa qof oo shan sano ka weyn ayaa gurigan ku noolaa ilaa 20th June 04 <i>(List the names somewhere separate and account for everybody as per the questions below)</i> Ku qor magacyada meel gaara ee dadkan	
12. How many above 5 yrs live in this household now? Imisa qof oo shan sano ka weyn ayaa ku nool gurigiina imika?	Number..... Tirada.....
13. Do you have any over 5 years old person in this household who has died since the 20th June 04	Yes.... No..... Haa.....Maya.....haday jirti imisaa ka yar shansano..... If yes, no. >5yrs.....
14. 14 Miyuu jiraa qof shan sano ka weyn oo gurigan ah oo dhintay ilaa 20th June 04	
15. 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 Ilmaha 4aad.....

Appendix 3:

Sampling frame for Dhusamareeb and Adaado September 2004(WHO NIDs 2004)

Location	Population	Cumulative population	Cluster Number
1. Dhusamareeb	10,000		1,2,3,4
2. Fargooye	150	10150	
3. Beer Cabd Farax	100	10250	
4. Gadoon	2600	12850	5
5. Inamad	1600	14450	
6. Xiindiiro	100	1450	
7. Mirig	85	14635	
8. Shimbiraale	100	14685	
9. Tagaabeey	100	14785	
10. Marrer Gur	3000	17785	6,7
11. Xananbuure	900	18685	
12. Gaatan	50	18735	
13. Qaloocon	40	18775	
14 Bohol	600	19375	
15.Cali Salaaxey	15	19390	
16. Laasxaado	50	19440	
17. Ballecad	400	19840	
18. Bumeey	50	19890	
19. Boore	50	19940	
20.Miirdugul	200	20140	
21.Qoryoweyn	140	20280	
22.Ilix	290	20570	8
23. Miircad	100	20670	
24. Sinadhega	150	20820	
25.Ceeldheere	2500	23320	9
26.Ceelgras	6000	29320	10,11
27 Ceelahelay	4000	33320	12
28. Guriceel	11000	44320	13,14,15,16,17
29. Gerijir	400	44720	
30. Dadaale	605	45325	
31. Shawa	210	45535	
32. Saciid Faruur	300	45835	
33. Dabare	600	46435	
34. Biyo Gaduud	240	46675	
35. Dhagaxyaale	380	47315	18
36. Dooyaale	260	47415	
37. Dabagodle	100	47465	
38. Labileey	50	47865	
39.Gabuun	400	48065	
40. Garoole	200	48345	
41. Toon	280	48745	
42. Afcagaag	400	49045	
43. Ceeldhaadha	300	49295	
44. Buhood	250	49345	
45. Calalaali	50	49375	
46.Jiingada	30	49875	
47. Calixasan	500	50075	19
48. Barax	200	50225	
49. Harale	150	50325	
50. Bubul	100	50455	
51. Fooleey	13	50605	
52. Qodqod	150	59455	
53. Cadaado	8640	59245	20,21,22

Dhusamareeb and Adaado Districts Nutrition Survey September 2004

54. Dayeeno	136	59381	
55. Qaradhi	100	59481	
56. Biyogaduud	264	59745	
57. Godinlabe	5000	64745	23,24
58. Dhagaxheere	300	65045	
59. Ard	490	65535	25
60. Baxdo	5500	71035	26,27
61. Cadokibir	1650	72685	
62. Ifdoole	430	73115	
63. Docooley	900	74015	28
64. Gidheys	1000	75015	
65. Galinsoor	4000	79015	29,30
66. Ruun	230	79245	

Cluster sampling interview 2,642 and 1st Random number 1927

Appendix 4: Traditional Calendar For Galgadud region Nutrition Survey

Month	Events	1999	2000	2001	2002	2003	2004
Jan.	Beginning of Jiilaal		57 Soonfur	45 Soonfur	33 Soonfur RRA attack in Tayeglow	21 Soonfur	9 Soonfur
Feb.	Mid of Jiilaal		56 Siditaal	44 Siditaal	32 Siditaal	20 Siditaal	8 Siditaal
Mar.	End of Jiilaal		55 Arafo/Dul-Xaj	43 Arafo/Dul-Xaj	31 Arafo/Dul-Xaj	19 Arafo/Dul-Xaj	7 Arafo/Dul-Xaj
Apr.	Beginning of Gu'		54 Sako	42 Sako	30 Sako	18 Sako	6 Sako
May	Mid of Gu'		53 Safar	41 Safar	29 Safar	17 Safar	5 Safar
Jun.	End of Gu'		52 Mawliid	40 Mawliid	28 Mawliid	16 Mawliid	4 Mawliid
July	Beginning of Xagaa		51 Malmadoone	39 Malmadoone	27 Malmadoone	15 Malmadoone	3 Malmadoone
Aug.	Mid of Xagaa		50 Jamadul-Awal Milihoare	38 Jamadul-Awal - Carta meeting/election in Djibouti	26 Jamadul-Awal	14 Jamadul-Awal	2 Jamadul-Awal
Sep.	End of Xagaa		49 Jamadul-Akhir	37 Jamadul-Akhir	25 Jamadul-Akhir	13 Jamadul-Akhir	1 Jamadul-Akhir
Oct.	Beginning of Deyr	Rajab 59	48 Rajab Milidabe	36 Rajab	24 Rajab	12 Rajab Start of Edoret reconciliation meeting, Kenya	Ramdadn
Nov.	Mid of Deyr	58 Shacaban	47 Shacaban	35 Shacaban	23 Shacaban	11 Shacaban	
Dec.	End of Deyr	Ramadan	46 Ramadan	34 Ramadan	22 Ramadan	10 Ramadan Harale fighting	

Jiilaal

GU'

Xagaa

Deyr

Carta meeting – The Djibouti meeting which culminated to the election of TNG

Appendix :5 Survey Teams

<i>Enumerators</i>	<i>Organisation</i>
1Cali Ahmeed	SRCS
2 Farah Abdi	SRCS
3Cabdi Rahim	SRCS
4Ahemed Muse	SRCS
5Cali Salaad	SRCS
6 Cabdulah C/le	SRCS
7. Sakari Ahmed	SRCS
8. Cabdula Ahmed	SRCS
9. Cabdulah Cabdulle	SRCS
10. Leylo Abdalla	SRCS
11. Faadumo Mohamed	SRCS
12.Asad Ahmed	SRCS
Supervisors	
1. Dahir Osman	SRC
2.Nasro Ismail	SRC
3. Mohamed Attam	UNICEF
4. Khalif Nouh	FSAU
5. Abdirahaman Hersi	FSAU
6. Mohamed Haji	FSAU
7.Abukar Yusuf	FSAU

Appendix 6: Prevalence of chronic malnutrition based on height for age Z-score

	<i>Males</i>		<i>Females</i>		<i>Total</i>	
	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>
Global chronic malnutrition (H/A<-2 z score)	19.4 (CI: 16.0-23.2)	95	18.4 (CI: 14.5-23.0)	64	19.0 (CI: 16.4-21.8)	159
Severe chronic malnutrition (H/A<-3 z score)	8.6 (CI: 6.3-11.5)	42	5.2 (CI: 3.2-8.2)	18	7.2 (CI: 5.6-9.2)	60

The prevalence of chronic malnutrition defined as height for age <-2 Z score was 19% (CI: 16.4-21.8) and severe chronic malnutrition, defined as height for age <-3 Z score, was 7.2% (CI: 5.6-9.2)

Appendix 7: Prevalence of underweight based on weight for age Z-score

	<i>Males</i>		<i>Females</i>		<i>Total</i>	
	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>
Underweight malnutrition (W/A<-2 z score)	34.5 (CI: 30.3-38.9)	169	28.9 (CI: 24.3-34.1)	101	32.2 (CI: 29.0-35.5)	270
Severe underweight malnutrition (W/A<-3 z score)	8.6 (CI: 6.3-11.5)	42	7.7 (CI: 5.3-11.2)	27	8.2 (CI:6.5-10.3)	69

The prevalence of underweight malnutrition defined as weight for age <-2 Z score was 32.2% (CI: 29.0-35.5) while the prevalence of severe underweight malnutrition, defined as weight for age <-3 Z score, was 8.2% (CI:6.5-10.3).

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