FOOD UTILISATION IN SOMALIA

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Food Utilisation in Somalia

Food Security Assessment Unit - FAO
Nutrition Surveillance Project

SUMMARY

Rationale for study and objective

The Nutrition Surveillance Project within the Food Security Analysis Unit aims to develop an understanding of issues that relate to food utilisation and nutrition that affect both urban and rural population in Somalia. The household economy framework for analysis used in the unit provides valuable information on the availability of and access to food. Less information is currently available on utilisation of food at the household level.

The following study was proposed by the Nutrition Surveillance Project at FSAU in order that specific issues at household level could be better understood. The objective of this study is to address gaps in the knowledge of food utilisation by identifying issues of concern and considering the implication of such issues in terms of their contribution to malnutrition.

Methodology

The study is based on available secondary information and primary data collected in Somalia. Qualitative and quantitative data provides the basis for the findings of the study. Focus groups, interviews and observations provided the means to collect information for the four case studies, details of the methodology is provided within the main body of this study and in the annexes that follow.

This study presents four case studies completed in four food economy zones in Somalia. Each one of the four food economy zones represent one of the four following basic livelihood systems:

- Agro-pastoral
- Pastoral
- Riverine
- Urban

Fieldwork for the case studies was completed in two sites in Somalia and within the following specific food economy zones as identified by FSAU:

- **Hiran Riverine** in the Belet-Weyne district of Hiran
- **Agro-pastoral: Southern Agro-pastoral** in the Belet-Weyne district of Hiran
- **Hawd Pastoral** in northern Wagooyi Galbeed region within a 60km radius of Hargeysa town
- **Hargeysa Urban** in Hargeysa town

Information concerning utilisation of food and consumption patterns at the household level was focused on the following areas:

- · Types of foods consumed within the food economy group
- · Seasonality of food access and use
- · Estimations of fluctuations in nutrient availability by season and wealth group
- · Indications of difference in access, use of food and nutrient availability by wealth group
- · Indications of prioritisation and difference intake for household members
- · Timing and meal frequency
- · Food preparation and meal composition

- · Processing, preservation and storage
- · Response to food shortage
- · Indications of change over time
- · Perceptions of malnutrition – perceived cause and responses

Main findings

Nutrient sufficiency at household level

· The case studies reveal consumption patterns that, outside of times of particular food stress, provide *the minimum or less than the minimum nutritional requirements* to a household.

· This is the case across the four food economy groups.

· This is clear both for energy requirements and requirements of proteins, fats, iron and vitamins A and C.

· Some households in all food economy groups have difficulties meeting basic household energy requirements.

· Less than the minimum requirements are most evident for poor households across the four food economy groups and for consumption patterns during the dry seasons.

· Composition of diets varies between food economy zones with nutrient availability also showing some variation.

· Micronutrient availability is, in some cases, as low as 10% of requirements. Poor agro-pastoral households show the lowest vitamin availability. Poor riverine and both poor and middle wealth groups in the agro-pastoral zone show 60% or less coverage of iron requirements.

· Not all consumption possibilities are exploited in some food economy zones. Bioavailability of nutrients is avoidably reduced in some cases due to preparation techniques. However the clearest deficiencies require attention to levels of production and purchasing power.

Intra-household distribution

· Within households, prioritisation of children was reported particularly in reference to food stress. Quantitative information on this subject is not available.

· No difference was found between the allocation of food between male and female children.

· Under consumption by pregnant women was found to be widespread.

· These elements show some consistency across the food economy zones.

The format of the case studies allows direct comparison between the different groups and comparative notes are provided following the case studies themselves. Variations in educational and productive inputs designed to increase availability of nutrients to households and individuals in Somalia need to be based both on the variations in the needs of the groups in question but also in the varying possibilities for interventions suited to these groups.

1 RATIONALE FOR THE STUDY AND OBJECTIVE

The Nutrition Surveillance Project within the Food Security Analysis Unit aims to develop an understanding of issues that relate to food utilisation and nutrition that affect both urban and rural population in Somalia. The household economy framework for analysis used in the unit provides valuable information on the availability of and access to food. Less information is currently available on utilisation of food at the household level.

The following study was proposed by the Nutrition Surveillance Project at FSAU in order that specific issues at household level could be better understood. Due to high malnutrition rates in many parts of Somalia even in times of relatively good food availability and access, FSAU saw the need for a focus on food utilisation as part of an effort to guide the design of intervention that could target specific problems.

The objective of this study is to address gaps in the knowledge of food utilisation by identifying issues of concern and considering the implication of such issues in terms of their contribution to malnutrition.

2 INTRODUCTION

This study provides a brief review of research on food consumption at household and intrahousehold level followed by the results of field studies completed in two geographical locations in Somalia covering four food economy zones. These studies consider general themes relevant for consumption patterns in each area followed by consideration of the following specific themes:

- Seasonality of food access and use
- Estimations of fluctuations in nutrient availability by season and wealth group
- Indications of difference in access, use of food and nutrient availability by wealth group
- Indications of prioritisation and difference intake for household members
- Timing and meal frequency
- Food preparation and meal composition
- Processing, preservation and storage
- Response to food shortage
- Indications of change over time
- Perceptions of malnutrition – perceived cause and responses

For each of the four case studies, implications of the information in terms of the likely contribution to malnutrition and as a basis for the design of interventions is given. A comparative conclusion follows the case studies.

3 RESEARCH ON HOUSEHOLD FOOD CONSUMPTION AND INTRA-HOUSEHOLD FOOD USE

Food consumption in general and energy and protein intake specifically as been noted as showing significant differences across wealth groups and differences between seasons in studies completed both within and outside Africa. These differences have shown, in many cases, a strong relationship with nutritional status. (see for example Van Liere 1994, Leonard 1989, Abdullah and Wheeler 1985)[1] Socio-economic variables have been studied as determinants of child and adult nutritional status (see Van Liere 1994) and context specific factors have been identified which allow both better understandings of socio-economic structures within communities and possible relationships with malnutrition. Landlessness and lack of access to off-farm labour associated with poor nutritional status in children in Kenya (Hitchings 1982, Fleuret and Fleuret 1983 in Fleuret 1963:92). A recent study in Ethiopia found households with more livestock less prone to seasonal undernutrition (Ferro-Luzzi et al 2001). The relationship between socio-economic position and the likelihood of malnutrition in particular has become a strong focus within the humanitarian world with a view to decision making about, and targeting of, food security and nutrition programmes.

Household economy analysis and specifically the Household Economy Approach (HEA) as developed by Save the Children has been used increasing over recent years by humanitarian actors to assess 'normal' household economy in a particular context and to predict the effect of change or adversity on access to food and income. Information collection and analysis focuses on the household's access to food and income through production, trade and employment. Baseline information collected includes percentage of income gained from different sources and percentage of food gained through different sources. While focused on production and exchange, the approach generates consumption information at the household level. Save the Children are currently developing an 'intrahousehold model' (IHM) to build on the well established household economy approach. As the household economy approach stops at the household level Save the Children are developing a model which allows an understanding of capacities within the household and to predict the impact of change on different household members. This approach will include developing demographic profiles of households, the different labour opportunities that exist for individuals according to age and sex and the constraints that prevent certain households from exploiting assets.

Marked seasonal variability of both production and consumption is common to both farming and pastoral systems in the developing world. Seasonal variation in consumption is linked structural and economic problems including lack of agricultural inputs, poor markets and infrastructure (Ferro-Luzzi et al 2001). Seasonal energy stress is less well documented than the widespread mortality and disease that accompany famine. However seasonal stress in 'normal' or near normal years is a background against which large-scale food shortage needs to be understood. The importance of seasonality is recognised in the HEA where the seasonal pattern of agricultural and other productive activities are documented, this gives indications about possible seasonal fluctuations in consumption. WFP data collection in south Sudan has focused more explicitly on consumption and 'consumption calendars' have been produced which compliment activity or production calendars.

The effects of seasonality on nutritional status, where they exist, vary with the age and physiological state of the individual concerned. Seasonal effects on the nutritional status of infants vary with the age at which the child first experiences seasonal stress and is related to their mother's experience of such stress. In children over 5 years of age seasonality of nutritional status is more likely to be due to food shortages that to infection (Ulijazek and Strickland 1993:81). Adult nutritional status is more likely than is the case for infants to be directly affected by food availability and, in many cases, the need to expand energy in excess of intake in performing work (ibid 62). While some elements of seasonality on nutritional status are physiological, there are also socio-cultural implications. When considered differences within the household that may have an impact on nutritional status, seasonal or otherwise, we are considering a combination of biological variation in nutritional needs and cultural

[1] For references on reported seasonal differences in child growth, adult body weight, incidence of infectious disease, birthweight, lactational performance, birth rate and childhood mortality also see Ulijaszek and Strickland 1993:61.

variation of food availability and consumption. 'Physiological vulnerability is modified by social factors which can totally reverse expected affects' (Rivers 1988:91 in Wedd and Harinarayan 1999).

Nutrition and food consumption were among the first areas of inquiry into the extent of intra-household differences in resource allocation. Research in South Asia was being completed as early as the 1950s by nutritional anthropologists (see Miller 1981). Research focused on Asia was developed in the 1970s and 1980s and concerned itself in the main with sex and age bias in nutrition and food intake.

Authors of a review of the subject of household gender and age bias from 1977 to 1996 could find scarce evidence of pro-male or pro-adult bias in consumption. The most consistent and the strongest evidence for this, in the review which covered Latin America, Africa, South Asia and the Philippines, was South Asia. Within South Asia large differences are clear across regions. (Haddad et al 1996:7). In Bangladesh Abdullah and Wheeler found that despite a social framework in 'which it would be acceptable for adult males to be given priority in food allocation, especially in times of food shortage' the average energy intakes for women where as appropriate to their assumed needs as the men's to theirs' (1985:1306 and 1312). In the few studies in Africa (Madagascar and Chad) available to the Haddad et al review neither sex appears to be favored in food allocation within the household. Authors also note the problem of 'publication bias' in the study of intrahousehold resource allocation. A comparative review of literature is likely to exaggerate the prevalence of studies that show gender differences, as 'negative' outcomes (no differences) are less likely to be published.

Leonard, in a study made on an Andean agricultural community found marked season fluctuations in energy consumption yet children under 12 years showed the least seasonal change in energy intake (1989). This study and one completed among the Turkana pastoralists in east Africa (1985 in ibid) conclude that in these particular communities, children appear to be protected against energy stress. This pattern, comments Leonard, contradicts the generally held view that children are most severely affected under conditions of food scarcity because resources are preferentially allocated to adult males (ibid). More recent work on seasonal energy stress in Ethiopia also concludes that Ethiopian parents may 'protect' the nurtitional status of their children, who show almost no impact of seasonality (Ferro-Luzzi et al 2001).

One problem with the evaluation of food sharing is the variation of food intake of adults and children according to their energy expenditure and work output. Growing children have a greater energy requirement relative to their weight than adults. People require more food energy to maintain body weight if they are doing hard physical work. Methodological problems exist due both to the unequal nature of requirements within the household and unequal of perceived requirements by sex and age. In study by Wheeler and Abdullah in Bangladesh mentioned above, it was found that young children receive food intakes which are lower in relation to their requirements than other household members. The explanation put forward is that the exceptionally high food requirements of small children is not fully appreciated (1985:1313)

Dietary prescriptions, restrictions and taboos can be classified according to the group within a population that may be at particular risk. Pregnant and lactating women are often subjected to restrictions of particular foods. It is 'debatable whether such restrictions are generally biologically harmful' (Ulijaszek and Strickland 1993:115). '[I]n many traditional economies, mean daily energy intakes do not appear to vary with pregnancy, lacatation, and the non-pregnant, non-lacatating state' (ibid. 44). Overall low food intake may have consequences for women and these consequences are difficult to tell apart from taboos related to restricted foods. Note needs to be taken of whether restricted foods form a habitual part of the diet and whether other foods of equal or unequal nutritional value take the place of restricted foods. Ross notes that any restrictions or taboos should be considered part of a general pattern of gender differences in food availability within the group rather than an occasional constraint as being pregnant or breastfeeding may be a women's general condition throughout her childbearing years (1987 in ibid 115-116). Jelliffe et al (in Ulijaszek and Strickland 1993) have reviewed traditional practices related to dietary management of diarrhoea in children and found a wide range of foods over 74 countries that are believed to cause diarrhoea as well as dietary avoidance during an episode of diarrhoea.

4 LEVEL OF CURRENT UNDERSTANDING OF FOOD USE IN SOMALIA

Although there has not been in depth data collection solely based around food consumption in Somalia, information on food economy, care practice and observations on micronutrient deficiencies all lend some insight into the understanding of household and intrahousehold food use. A brief summary of both the information available and the sources of the information are given here.

Levels of malnutrition in Somalia vary on a seasonal basis and between different geographical areas and population groups. They are strongly affected by events that impact on overall domestic production of food, household food production and reserves, purchasing power and levels of import and export. Variations in production level and purchasing power are well developed as food security indicators and are of great use in understanding the availability of and access to foods by households in Somalia. Knowledge of the causes of malnutrition and of food insecurity specifically has grown significantly in recent years. The household economy framework developed originally by Save the Children has been employed in Somalia as a tool for collecting and analysing data concerning the availability of and access to food.

The household economy approach mentioned above is well developed in Somalia and baselines are currently development and managed by FSAU. Household economy baseline studies illustrate how households in different Food Economy Zones (FEZs) access food in a 'normal' year. This is completed through a quantitative description of the economy of a defined population, including all the main factors determining household income and potential household income under changed conditions and how these vary between households. The aim of the method is to indicate the likely effect of crop failure or other shocks on future food supply through the analysis of the relationship between a shock and the ability of households to maintain their food and non-food consumption. Through this method one has access to basic information concerning sources of food for each FEZ which are presented as an percentage of foods 'purchased', 'as gifts', 'from own production' and 'wild'. The percentage indicates the amount of kcal gained annual from each food source. Seasonal calendars indicate fluctuation in production from which fluctuations in consumption can be estimated to some extent.

Levels of micronutrient deficiencies are understood to be high in Somalia. Identification of micronutrient deficiencies has been through clinical assessment although the information is limited with the additional problem of different diagnostic criteria used in different surveys. UNICEF considers that iron-deficiency anaemia and vitamin A deficiency are serious problems in the Southern and Central zones but less so in the north of Somalia. Vitamin C deficiency has been a problem under protracted emergency conditions (1998:134). There has been no recent systematic attempt to link clinical assessment of micronutrient deficiencies with food use in Somalia. It is generally suggested that nomadic groups suffer less from deficiencies of vitamin C and A than settled agricultural groups due to camel milk providing a good source of both vitamins. Cereal-based diets reduce the percentage of available iron absorbed (UNICEF 1998:118).

UNICEF reports that 'male members of a household are considered to be most important to its survival and tend to have first access to food throughout their life-cycle'. The organization comment that 'prior to the civil war, it was reported that men and boys traditionally ate first and separately from the women and young children, who ate what remained' (ibid 123). In a multi-sectoral survey in the North-East in November 1997 the father was 'almost always' in the first group to eat, young children also ate fist in almost 90% of cases. It also found that in 'almost 50% of households grown-up boys ate before grown-up girls' (ibid 123-4). Anthropometric surveys completed in Somalia do not show significant differences between rates of malnutrition for boys and girls. Recorded taboos relating to food for pregnant and lactating women are limited. One report of infant feeding practice in Bay and Bakol notes that some mothers consider honey and sheep's meat to be bad for pregnant women (UNICEF 1994) and a study in Mandera district of Kenya notes that some women consider eggs to be bad for pregnant women (AAH-UK 2001a).

It is well known that children tend to be privileged consumers of available milk is Somali communities; they may also be privileged in terms of food in general. However the sharing of food in times of shortage among all household members is also a recurring theme in reported consumption patterns. This has been particularly

highlighted within the humanitarian community due to the issue of household use of supplementary food which has been theoretically provided only for the consumption of malnourished children within that household (IMC 1997, UNICEF 1997, AAH-UK 2001b, ACF 2002).

5 NOTES ON METHODOLOGY

This study was completed using both available secondary source information, both theoretical and context-specific, together with primary research in Somalia. Fieldwork was completed in the locations mentioned below using key informant interviews, guided focus group discussions and observations for questions used in the field see annex one). The findings are presented as case studies that follow the same themes allowing data to be compared.

5.1 Locations used as case studies

Five main 'livelihood systems' have been identified by FSAU in Somalia (for livelihood systems map see annex two). Livelihood systems should be considered as practical categories for distinguishing the different ways in which Somalis access their food and income. As populations that use different livelihood systems vary in the ways they access food and income they also vary in the types and proportions of food consumed. This is because the livelihood groups are both systems of production and of consumption. The differing physical environments and geographical locations where the systems exist and the types of production the group engages in to a large extent dictates consumption. Consumption patterns are always embedded in social and cultural factors and as the population of Somalia is not a homogenous group with one livelihood pattern we can assume that *ideas* about food, consumption and malnutrition may vary, influencing consumption patterns. It is for these reasons that the livelihood systems provide a starting point to identify groups to study.

The livelihood systems

Pastoral – households that rely on livestock for food and income

Agro-pastoral – households that cultivate as well as owning livestock

Riverine – domestic production is derived exclusively or almost exclusively from farming with minimal livestock holdings, these households are located near rivers in southern Somalia

Fishing – households that access food and cash through fishing activities in coastal areas

Urban – households situated in urban areas

FSAU has well-developed information on pastoral, agro-pastoral and riverine systems, and very limited information on fishing and urban households.

Within the broadly defined groups described above, more than 25 Food Economy Zones have been identified in Somalia. These zones illustrate in more detail the strategies that people employ to acquire their food and income, as despite belonging to that same livelihood system populations in different geographical areas differ to some extent.

This study aimed to focus on one Food Economy Zone (FEZ) from the Pastoral, Agro-pastoral, Riverine and Urban livelihood systems to present a comparable case study for each (food Economy Zone map see annex two). Within the case study is an indication of the likely similarities and differences the FEZ presents in comparison to other zones within the livelihood system. Within each food economy zone, wealth categories are defined with reference to the area (relative wealth) and for the purposes of this study we refer to 'poor' and 'middle'

households. Poor households are estimated to make up 25-35% of the food economy zones and middle households 40-60% of the population.

Food Economy Zones and their geographical location had to be chosen within the practical and security related restrictions that exist when considering field work in Somalia. Locations accessed and the FEZ studied within these locations were as follows:

Riverine: Hiran Riverine in the Belet-Weyne district of Hiran
Agro-pastoral: Southern Agro-pastoral in the Belet-Weyne district of Hiran
Pastoral: Hawd Pastoral in northern Wagooyi Galbeed region within a 60km radius of Hargeysa town
Urban: Hargeysa town

5.2 Household food access and use with particular reference to seasonal fluctuations and change over time

Before fieldwork, a list of foods was compiled as consumed in Somalia, this list aimed to be exhaustive (in terms of foods consumed in Somalia) and to be adapted in the field to each food economy group and location visited. Foods were confirmed as consumed by the group in question by a key informant or deleted from the list. This adapted list was then used as a reference in group discussions, all members of any one focus group belonged to the same food economy zone and wealth group. Quantities of foods used within the household were reported according to season. From the foods list, a spreadsheet showing the representative nutrient values of foods consumed was made, from which percentages of nutrients gained could be calculated against recommended intakes. This calculation allows comparison of the nutritional value of diets between *households* of different food economy groups, wealth groups within food economy groups and across seasons.

The households described in the case studies are necessarily hypothetical ones. This study considers household consumption using a 'typical' household in much the same way as the Household Economy Approach builds up a picture of the food economy of a given area in order to illustrate household access to food energy[2]. Unlike food needs studies focusing on food energy only, this study considers specific nutrients which are necessary for an adequate diet. The information given within the case studies should be understood as *estimates* of nutrient availability. For details on the household model used for this study, choice of nutrients assessed and consideration of the different requirements of individuals within the household see annex three. For consideration of the actual allocation of food according to age and sex see the following section.

Information for calendars showing production and income for the various food economy groups were initially put together by SCFUK – FSAU in 1998 and some detail as been added to these calendars since that time. The existing seasonal calendars as appearing in a forthcoming publication at FSAU have been adapted for use as a methodological tool for this study. The aim on the field was to build a 'consumption calendar' using the production calendar as a guide and cross-referencing tool. Wealth ranked focus groups from various food economy groups provided consumption information that could be recorded on the seasonal calendar and subsequently studied on the spreadsheet (for example of the spreadsheet see annex three, for completed calandars see annex four).

Cross-checking for levels of association was made with key informants using both food frequency tables and 24 hour recall. Frequency tables allow a cross-reference over seasons where the recall is specific to a particular season. 24 hour recall clearly is only possible for the current season. 24 hour recall data does allow the information for the 'the hypothetical household' as explained above and in annex one to be compared and cross-checked with actual households. All methods, aside from the observations possible in the field, used reported intakes, while some methods documenting usual consumption over long periods of time, others aim at understanding actual intake as precisely as possible for a finite time. These methods are used primarily to elicit

[2] For a full description of this approach see Seaman et al: 2000

individual consumption data and were modified for this study so that a key informant or group reports the intakes of all household members.

The data collection for change over time involved open questions asked in both focus groups and interviews. Particular note was taken of intergenerational difference in perception of changing consumption patterns over time. The time period over which possible change was considered depended to some extent on the age of the informant as some reference points such as 'before you married' were directly linked to the age of the informant.

5.3 Intra-household food utilisation

While the collection and analysis of information as described above allows a detailed understanding of different food utilisation at household level according to food economy group, wealth group and season it does not give indications of preparation, meal composition or meal frequency. Nor does it give an indication of intra-household distribution of the foods. In both cases data collection was necessarily qualitative and took place both in focus group discussions and interviews. Concerning meal preparation and the like, open-ended questions gave participants more room for discussion and debate which in turn provided the researchers with more detailed information. Guided discussions allowed a systematic approach to be employed with an element of flexibility. Information concerning the prioritisation of food among household members was considered using the same methods. While the period of time over which fieldwork was completed and range of subjects covered was not sufficient to analyse intra-household consumption patterns using quantitative techniques[3], qualitative information was used to give indications of its implications in terms of intra-household dimensions of nutrient intake and deficiencies. Limited observation of food processing, preparation and cooking was possible. This observation allowed both important cross-checking of recall data and in some cases opened up new lines of inquiry.

[3] For quantitative methods of assessing proportional intake and changed proportional intake over the seasons see for example Abdullah and Wheeler 1985.

6 CASE STUDIES

6.1 AGRO-PASTORAL CASE STUDY

6.1.1

Name of food economy zone represented by the case study:

Southern Agro-pastoral: Mixed pastoral and camel, cattle and sorghum (see Food Economy Zone map annex two)

Description and location of the group interviewed:

Two agro-pastoral settlements were visited in the Belet Weyne district of Hiran region. 12km north-east of Belet Weyne Ilkacade is an agro-pastoral settlement of around 60 households. Sorghum is the only cereal crop grown in the rainfed land surrounding the village. The majority of the population has not planted for the last two Gu seasons and currently purchase all their cereal. The main livestock holding is cattle. Bur Fiiq is around 10km south-east of Belet Weyne town and consists of 40 households. The only crop is sorghum, though beans have been attempted in the past without success. The Gu crop has been harvested in the main for fodder, though some households have harvested grain, reported by those households to be between 10% and 40% of a normal harvest. The main livestock holding is cattle.

Likely level of representation of the food economy zone and livelihood system as a whole:

Households within the southern agro-pastoral food economy zone are more dependant on livestock production over crop production unlike the Bay-Bakool high potential zone (see Food Economy Zone map) in which households rely more heavily on crop production than livestock production. Access to milk and its presence in local diets, is likely to be higher for the southern argo-pastoral communities. This is particularly the case in settlements visited (during the Hagau season) as large and small stock were reported to be close to settlements.

While some southern agro-pastoralists own camels, the households visited for this study in the locations above own cattle and goats. Some southern agro-pastoralist grow maize, cowpeas and tomatoes, this was not found to be the case in villages visited. In a year with good crop production this is likely to influence consumption to some extent. Higher consumption of tomatoes for example (as was found to be the case in the Riverine FEZ) is very likely if grown in the area even for households who don't produce them themselves due to the low cost and accessibility. In areas where a more diverse crop is possible a more diverse diet is more likely.

Poor rains in the areas visited have restricted the consumption of own production but this has not reportedly changed consumption patterns either in types of foods or quantities consumed. An exception appears to be in Bur Fiiq where interviewees reported a preference for maize over sorghum. With little own production of sorghum, higher maize consumption is likely.

Particular constraints for information collection:

A limited number of women were present in Ilkacade. Many had left for the day to the nearest dry season water point at Eelgaal. As many of the women had left to sell bush products more of the residents remaining in Ikacade were representative of the middle and better off wealth groups than the poor. These households are more likely to gain income from livestock sale than sale of bush products and petty trade than the poor. Following interviews in Ilkacade the team moved to Eelgaal. Participants in study in Eelgaal were residents of that settlement; a site of a water point and situated on a main road. These households were found to have characteristics more associated with an 'urban' FEZ than agro-pastoral. That is they were ex-pastoral or agro-

pastoral households now engaged in labour, petty trade and the collection of bush products and without own crop or livestock production.

6.1.2

Food list relevant to the case study

Foods mentioned in the food list and regularly appearing in diet recalls and interview data	Foods included on the food list as available to the group but not mentioned as a regular feature of household consumption
Sorghum, Maize, Beans, Camel, cattle and goat milk Game meat Camel and goat meat, Sugar Oil Wheat flour Rice Pasta Tomatoes Onions	Green peppers Honey Citrus fruit Mango Wild fruit (Ohob, Jiib, Damiik, Mareer)

General themes

· Diet based on cereal
· Due to limited or no harvest, currently either sorghum or maize purchased
· Sorghum consumed in the first village with limited maize used
· Price of maize and sorghum equal or a little higher for maize
· Village 2 reported a preference for maize consumption
· Use of purchased wheat flour
· Wheat flour 45% higher in price than whole maize or sorghum
· Preference for milling maize and sorghum incurs up to 40% loss of product (used as animal feed)
· Limited use of purchased beans
· Milk intake according to availability from own production, limited purchase also recorded
· Game meat purchased from hunters, limited use of other meats
· Vegetables purchased (tomatoes, onion and green pepper) used in limited quantities as addition to cereal, particularly in the absence of milk
· Citrus fruit (purchased) used in very limited quantities and rarely
· Wild honey has very limited availability
· Some wild fruits collected by some households
· Wild leaves known of and available but not reportedly collected, bean leaves not consumed, considered by some households to be animal food only
· No fish consumption found, some informants commented they would not eat it even in the absence of all other foods

Seasonality of food access and use

· Seasonal variation based around access to milk.
· Higher the milk intake the less cereal consumed
· Max reduction in cereal intake reported to be 50%
· Highest milk availability and use during Gu season
· Vegetables used in very limited quantity or not at all during rainy seasons, if milk is available
· Lower sugar consumption for households, if milk is available
· Lower vegetable oil consumption by some households during the rainy seasons
· If ghee is available to household, vegetable oil not used or used in very limited quantities
· Higher consumption of meat during dry season, due to both availability of game meat and lower prices of purchased meat during dry seasons. Likely use is once or twice a week when possible.
· Fruit, if used, shows little seasonal variation
· Wild fruits available, and consumed by some households, in limited amounts during dry season

Estimations of fluctuations in nutrient availability by season and wealth group

Wealth group	Dry seasons	Wet seasons
Middle	1000g of wheat flour 1000g of milled sorghum/maize 500g sugar 100g toms 50g onions 150ml oil 1000ml cows milk 500ml goats milk	1500g sorghum/maize 300g sugar 50ml oil 2500ml cows milk 1500ml goats milk
Estimated coverage of requirements	total kcal, total protein and fat, 59% iron 27% Vit A 22% Vit C	total kcal, protein and fat, 65% iron 65% Vit A 19% Vit C
Poor	500g milled sorghum 1000g of whole sorghum/maize 100ml oil 300g sugar 100g toms 500ml goats milk	500g milled sorghum 1000g whole sorghum 100ml oil 200g sugar 500ml goats milk 1000ml cows milk
Estimated coverage of requirements	78% kcal, 94% protein 66% fat 59% iron 11% Vit A 15% Vit C	81% kcal total protein 82% fat 60% iron 24% Vit A 7% Vit C

Calculated for a household of 6 – see annex one.

Estimated fluctuations in nutrient availability for agro-pastoral households in dry seasons (Jilaal and Hagau) and wet seasons (Gu and Deyr)

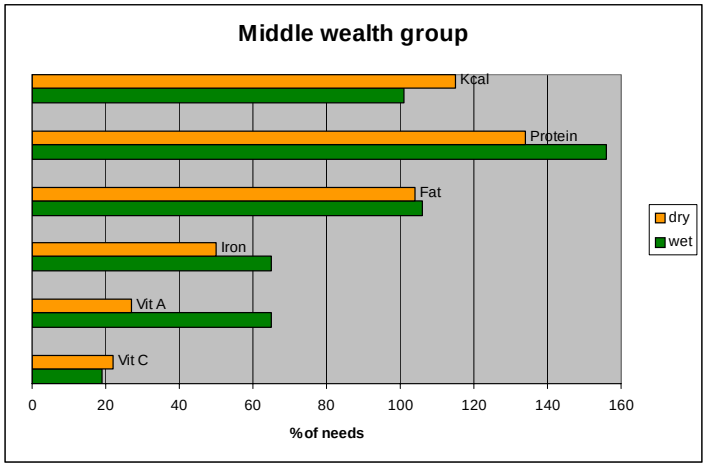
Average daily consumption in all seasons shows insufficient availability of some nutrients. Protein availability appears in be good, kcal sufficient in some cases and fats sufficient in some cases. Iron, vitamin A and vitamin C availability is low in all cases. Cereal item consumed influences availability of iron as cereal makes up such a large proportion of the total consumption, sorghum provides a better source of iron than maize (which replaces sorghum in some cases), the least iron is found in wheat flour. While maize is higher in fat than sorghum and middle wealth group consumption is not found to be low in fat.

The occasional use of rice or pasta by the middle wealth group replacing some of the sorghum used decreases the availability of iron. The use of meat (more likely and frequent in the middle wealth group) in the dry season increases availability of iron. Information on whether cereal consumption decreases when meat is added to the meal varied for household to household and was not consistent by wealth group. Use of purchased fruit is very limited and irregular and was therefore not added to the daily intake shown.

Middle wealth group

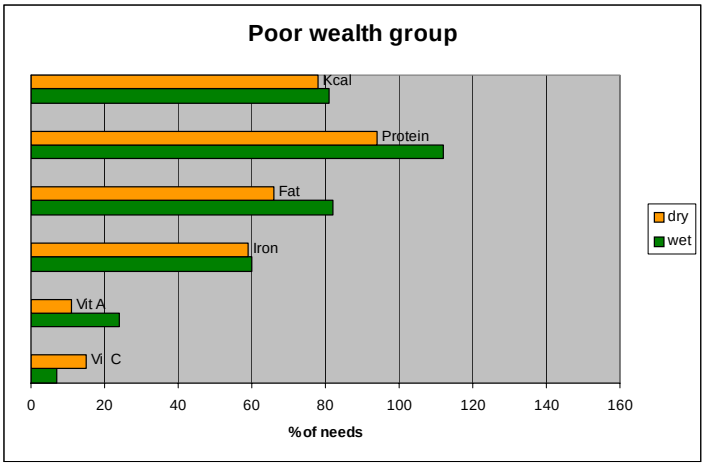
Change in vitamin A is due to the higher milk intake, vitamin C also increased in the rainy season *if* the content of the larger milk supply out-weighs the lack of vegetables, and in this case it does not. The proportion of milk sold will greatly influence micronutrient availability to the household. Higher levels of fat and protein relate to replacement of cereal with milk during the rainy seasons. The middle wealth group may consume slightly less kcal during the wet seasons although the supply is likely to be adequate.

Iron availability is low due to preference of wheat flour in the place of some sorghum in dry season and although there is a small rise in the wet seasons milk availability, in the quantities shown does not make a significant difference. Reduction of cereal consumption in the wet seasons is shown as 25%.



Poor wealth group

More limited access to milk means that the poor household is less likely to lower intake of sorghum during the wet seasons. The addition of a limited milk supply to the cereal means an increase of availability of total energy, protein, fat and vitamin A. There is likely to be a marginal difference in iron availability. The lack of tomatoes decreases the limited supply of vitamin C which is not replaced by the supply from milk.



6.1.3

Focus on indications of difference in access, use of food and nutrient intake by wealth group

The main difference found between middle and poor households is milk consumption, lower for poor households in all seasons. While poor households have some access to milk, even rainy season access is limited. As shown in the tables illustrating seasonal fluctuations, this limits the change in diet for poor households during the wet seasons. It also means that a poor household's need to purchase in the common event of a poor harvest is high all year. A poor household is more likely to focus purchase and therefore consumption on basic cereal supply thus limiting use of vegetables, vegetable oil and meat. They are less likely to consume wheat flour as a regular food than middle income households are.

While access to and consumption of vegetables is more limited for poor households the difference is not generally a large one. This is due to the limited use of vegetables in general by the FEZ and the preference of middle wealth group households to use income to purchase higher cost alternatives to maize or sorghum such as wheat flour and occasional rice or pasta than purchase larger quantities of vegetables. Increased purchase of sugar is also common with increased purchasing power to be used in the all-important tea, served were possible throughout the day. This is particularly the case during the dry seasons when milk is limited. Poor households tend to limit their sugar consumption only when absolutely necessary and will in some cases lesson cereal purchase before sugar purchase.

Total cereal consumption and therefore total energy available to the household shows some variation between middle and poor households. It is a clear difference between middle and very poor households. While seasonal change in diet is more limited for poor households the likelihood of fluctuations in total food intake is more likely as their resource base and purchasing power is more limited. Where a household member is unable to gain income due to illness or lack opportunities or if expenses are incurred through illness this is more likely to have an influence on the total food basket than for middle households.

The use of whole sorghum or maize rather than milled cereal is more common in poor households. This increases the quantity of cereal available from either own production or purchase and preserves more nutrients, as nutrients are not evenly distributed in the grain. It does, however, increase the cooking time and therefore firewood necessary, in turn incurs more time for firewood collection.

Intake of fat is limited for poor households during the dry season due to both limited oil purchase and lack of milk; this is not the case for middle households. Iron intake appears slightly higher of poor households than middle in all seasons. This is a consequence of avoiding wheat flour and to the limited decrease in sorghum intake during the wet seasons. Vitamin A available to a poor household is lower than for a middle household during the dry season due lack of comparable milk consumption. Vitamin C is lower all year when comparing a poor to a middle household due too more limited vegetable and milk consumption.

6.1.4

Focus on indications of prioritisation and difference in intake for household members

The focus of those interviewed on this subject tended to be exclusively on the prioritisation of children, particularly young children and infants within the household. This was mentioned in reference to allocation generally, in seasonal fluctuations of different foods and in times of food shortage. The subject is generally illustrated with reference to milk. When milk production declines children will continue to take milk after other household members have ceased. With limited milk supply it is reserved for the young children. If very limited it tends to be reserved for the youngest child, even or especially if that child is still breastfeeding as 'the others can eat adult food' i.e. grain. Limited milk is often given to infants and children diluted with water or in tea. With reference to seasonal change, one woman commented that even if milk is not in very good supply sugar consumption could reduce by 50% as the children drink the milk leaving the adults with the sugar. There is a

preference for cow milk over camel milk for children as the later is considered too strong and gives them diarrhoea. No difference was found between the allocation of food between male and female children.

While children tend to be exempt in theory from eating only at regular meals as they cannot 'resist hunger' in the way that adults can, cooked food is not prepared for them outside of the 2 or 3 meals eaten by the whole family. In practice this means that 'extra meals' consist of milk if available otherwise tea. Children may also collect wild fruit when available. This is not considered part of any meal. Wild fruits have a strong association with children and women collecting firewood in the bush who 'pick and eat' Hohob as they herd or collect bush products following rainy seasons. These foods can be eaten by any household member if they are brought back to the house. The exception is Mareer, which children cannot eat due to it's seeds.

Pregnant women were said to eat the same foods as other household members. Most commented that it was normal to eat the same quantities but it was also mentioned that it was difficult to eat the normal amounts because the belly was so 'full with the baby'. Deliberate under consumption to restrict the growth of the foetus was not explicitly mentioned but appears very likely. Lactating women *are* generally considered to eat more than other women as 'she is eating for herself and the baby'. No particular foods were thought to be good or bad pregnant or lactating women who eat the same meals as other household members.

The reported meal serving and groups of persons eating together varies greatly between different households and shows some relationship to the size of the household. Small households (one or two adult and a few young children) will tend to eat together, the mother aiding any young children. Households with larger numbers of children may serve them first, the couple eating afterwards (together). Some larger households serve the older males first (father and older sons), followed by the young children (mixed boys and girls), older girls and mother eating last. The only reasons given for this order were of a pragmatic nature 'women eat last because they are busy serving'. If a household member is ill they may not be able to eat 'normal foods' and should be given foods that are easy to eat like milk. Lemon juice was also mentioned as good for ill persons. No food avoidance was mentioned during illness.

6.1.5

Timing and meal frequency

All but the poorest households consume something at sunrise or soon after. At the most limited this is tea but commonly a meal made from cereal and oil in the dry season or milk in the rainy season if the household has a milk supply. A further meal is cooked either at midday or in the evening. The meal is most likely left until the evening when no young children are present in the household. Some households have three meals per day, these households are more likely to be middle wealth group but this is not completely consistent. A 'meal' may consist of tea only if taken in the morning, milk only or most commonly cooked cereal with or without meat, milk or vegetables and oil.

Food preparation and meal composition

Milk – may be consumed fresh or sour, if cow milk only fresh, goat or other milk is added to tea when available. Tea always contains large quantities of sugar outside of cases of food stress.

Canjeero (Anjera) – commonly eaten for the morning meal and is based on boiled, ready milled wheat flour with no or little sorghum added, oil poured on top, if ghee is available this will replace vegetable oil .

Soor – sorghum or maize porridge made by boiling milled sorghum or maize in water and adding the most finely milled cereal towards the end of cooking to bind, eaten with oil.

Cambulo – whole maize with or without beans or whole sorghum with or without beans boiled in water and eaten with oil (traditionally sesame oil).

Soor and Cambulo may be eaten alone with milk or meat (boiled or fried) or with Dalabilash – a source made from boiled, then fried tomatoes, it may also contain onion.

All cereals absorb nutrients when they are cooked which increases volume or bulk but decreases the concentration of energy and nutrients. The long cooking time of tomatoes used to prepare dalabilash will cause nutrient loss.

Processing, preservation and storage

Grain

While informants in one village reported past use of the bakarr, in the other the use of underground grain storage had never been practiced. The bakarr is, when in use, reused each harvest and burnt before each use to kill insects in the soil around it. Grain is stored in a deep hole following drying in the sun. The hole is sealed; opened to remove grain as needed then resealed. Loss is incurred through storage in quantity due in infestations and deterioration in quality due to protein and fat break down and lost of vitamins.

Preference is for milled grain flour over whole grain. While cooking time is an issue, taste is most frequently mentioned as the reason. Wheat is bought ready milled, milling of sorghum and maize is generally completed at the home or nieghbours using a pestle and mortar then a grinding stone. Some prefer to eat maize if consuming whole grain. Milling removes a large proportion of fibre, minerals and vitamins along with some of the proteins. However some account should be taken of the young child's inability to digest and absorb nutrients from diets containing too much fibre (Cameron and Hofvander 1983 :53).

Milk and meat

Milk drying is not practiced. Ghee is produced by households that have larger livestock holdings. It is used to replace vegetable oil.

Several women said that meat drying was occasionally practiced. Meat is cut into thin 'ropes' and hung from trees where is dries. The thin strips are stored in a sack. This can be crushed and boiled to make soup. Air-drying causes some vitamin loss but there is little change in protein value.

Wild foods

No reported storage of wild foods. Wild foods mentioned are all fruits and are eaten raw either while herding and gathering firewood or brought back to the settlement and eaten that day or the following day.

6.1.6

Response to food shortages

Responses here were mixed. Some informants said all but the youngest infants suffer during food shortage, others in keeping with the theme of privileging children in general said all children were fed first, adults eating only what they left. If meals are missed children may get milk or tea in place of a cooked cereal meal as they are known to be unable to resist hunger in the way that adults can. In responses on the subjects of response to food shortage and eating patterns of different household members, many noted that children and the elderly were 'the same', that is they had the same weaknesses and need for regular food. Food type was often also mentioned in this context, as the inability of young children and the elderly to eat whole grain means they need to be privileged in other products which places great strain on households during times of food shortage.

6.1.7

Focus on indications of change over time

The only reoccurring point raised by informants here was the more limited availability of milk, ghee and meat as compared to an unspecified point in the past. This was related by informants primarily to drought and the livestock losses caused by drought. Looting, the domination of other clans and grazing rights issues where also mentioned. Lack of harvest may also incur a larger proportion of milk sold in order to meet other expenses, though informants did not mention this. Many interviewees noted that changing food consumption over time was strongly connected to life cycles. Higher past milk consumption was not only linked to higher livestock numbers but also to the fact that the 'younger you are, the larger share of the milk you receive'.

One wild fruit, called Xmur has not been seen in the area for two years. Some informants commented that wild fruits in general had reduced availability. The last use of underground storage for harvested grain was four years ago although this was not directed connected to change in consumption patterns by those interviewed.

6.1.8

Perceptions of malnutrition – perceived cause and responses

Most informants suggested that malnutrition was present in their area. One group of informants denied that this could be the case, one mentioning that we shouldn't 'curse the village' by mentioning it. The main cause of malnutrition was noted to be drought, as 'malnutrition and drought go together'. Malnutrition was strongly related to lack of *quantity* of food in discussions but non-specific disease was also mentioned as possible cause. The most clear connection was made between malnutrition and lack of milk and meat.

A person is known to be suffering from malnutrition if they have any of the following features: thin, lack of appetite, less energy to work, weak, inability to walk well, loose hair or hair that changes colour, lack of blood, big belly, pale face, swollen feet, hand and legs, fast and loud heart beat.

Malnutrition is known to mainly affect the children and the elderly because they are not strong and need 'more attention in terms of food'. You can try and prevent it by getting more food but informants noted, if a mother doesn't have something to give she can't give it and therefore malnutrition is not always possible to prevent. If it is possible to find milk and meat, both prevent and cure malnutrition. Women can be affected by malnutrition, this is mainly caused by loss of blood during birth.

6.1.9

Implications of above information in terms of likely contribution to malnutrition

· Average daily consumption in all seasons shows seriously insufficient availability for some nutrients of both wealth groups.

· Energy consumption, outside of periods of food stress appears to be adequate or near adequate according to most reported consumption at sites visited. Energy availability is low for poor households and inadequate for the very poor. It is likely that further attention needs to be paid to the possible impact of labour intensive periods of agricultural work due to its impact on energy needs of those members of the household working.

· Nutrient availability shows a strong relationship with socio-economic group with the poor showing greatest deficits.

· Lack of purchasing power limiting the purchase of rice and pasta is likely to be of more benefit than harm as many nutrients are lost through use of such refined products. However highly milled rice contains little fibre and therefore can be digested and absorbed easily which is an advantage for young children.

· Under-nutrition becomes a serious issue when purchasing power falls below a level where adequate cereal supplies of any kind can be purchased for the household, this is not uncommon particularly in poor households and is common place in very poor households.

· Iron, vitamin A and vitamin C availability is low in agro-pastoral diet. Limited use of vegetables and fruits restricts the availability of micronutrients. The fact that the small amounts of vegetables are cooked further decreases the availability of micronutrients. Cereal-based diets reduce the percentage of available iron absorbed by the body.

· Increased availability of milk during the rainy seasons increases the availability of vitamin A, but amounts of milk consumed are unlikely to provide sufficient vitamin A.

· No food taboos were identified which restrict food intake for particular household members but there is strong evidence of general under consumption by pregnant women.

· Pregnant women suffer from very low iron intake as availability is low for the household as a whole, no extra allowance of iron rich foods are given to pregnant women and their iron needs are high.

· Reported consumption patterns privilege children over adults, particularly young children but other research (outside Somalia) has shown young children may receive food intakes which are lower in relation to their requirements than other household members, as the exceptionally high food requirements per kg of small children is not fully appreciated (for example Abdullah and Wheeler 1985). Using recall methods it is not possible to examine this idea.

Implications of above information as a basis for the design of interventions

· Food-based interventions using a combination of agriculture and education strategies deserve attention yet lack of experience in promotion, implementation and evaluation of programmes is clear as are the limited options available in the Somili agro-pastoral context.

· Educators should only recommend nutrition guidelines which are practical and acceptable to the community, which restricts possibilities in this area. Participants in this study showed a lack of information on the nutritional value of foods but a strong interest in the subject.

· The understanding of the value of vegetables is low and particular attention needs to be paid to the promotion of green leave use particularly with reference to pregnant women. Note should be taken of the local assumption that anything ‘nutritious’ or ‘with vitamins’ creates the undesirable excessive growth of the foetus.

· The promotion of home production of vegetables or a diversified crop in general is difficult in rainfed areas. Programmes involving vegetable production have taken place in some rainfed areas of Somalia.

· The promotion of small animal husbandry in order to increase the milk availability would be welcomed but raises questions of efficacy and effectiveness in drought prone areas.

6.2 Pastoral Case study

6.2.1

Name of food economy zone represented by the case study:

Hawd Pastoral: Camel, sheep and goats (See Food Economy Zone map in annex two)

Description and location of the group interviewed:

Those met and interviewed for this case study were found along the roads to Salahlay and Baligubadle 60km south of Hargeisa town and in the area of Bandar Waaag, east and south-east of Hargeisa in the Wagooyi Galbeed region. The households were herding camel and shoats in the surrounding area. Though some of the households were separated from the large stock, the majority were living as one unit.

Likely level of representation of the food economy zone and livelihood system as a whole:

Hawd Pastoralists keep camel and goats in the largest numbers but may also keep cattle and sheep. Pastoralist households interviewed for this study did not own cattle, rather a mix of camel and shoats. Indications are limited concerning size of livestock holdings and wealth group characteristics for this FEZ in comparison with other pastoral zones, however the following themes are of relevance. Cattle play a smaller role in Hawd pastoral households compared to some southern pastoral groups, which may heighten the influence of camel milk on consumption patterns but possible mean lower production of ghee in comparison with southern groups.

The livestock ban has hit the pastoralists in the north of Somalia and Somaliland harder than those in the south as the export market is of great importance and they do not have access to Kenyan livestock markets. This has limited purchasing power. Hawd pastoralists were displaced during war and some have struggled to replace herds, some of these households have taken up agro-pastoral practice. One the more positive side the Hawd pastoral zone is known for good browsing and grazing and remittance plays a greater part in the northern pastoralist economy than the southern; these may be mitigating factors. Wild fruits and leaves play a very limited role in the consumption patterns of those households interviewed; this is reportedly common to the area as a whole not necessarily to other pastoral groups.

Particular constraints for information collection:

In common with all information collection involving nomadic communities, locating informants was a time consuming task. Taking opportunities to meet households accessible from useable roads was limited and some individuals were interviewed while herding or walking to sell milk and not inside their homes. This made making direct observations of cooking or food preparation and measurement impossible. Focus group discussions were clearly very limited in this context. The large scale movement to the far north or south or the area accessible due to poor Gu rains added to access difficulties.

Some households were interviewed at permanent homestead sites. These households are more agro-pastoral (known as North West Agro-Pastoral by FSAU – see Food Economy Zone map) than ‘pure’ pastoral. As many of such households had recently adopted an agro-pastoral lifestyle and were from a pastoral background, these households could be considered in comparison with the pastoral households. This is discussed further in section 7 - focus on indications of change over time in this case study.

6.2.2

Food list relevant to the case study

Foods mentioned in the food list and regularly appearing in diet recalls and interview data	Foods included on the food list as available to the group but not mentioned as a regular feature of household consumption
Sorghum, Maize, Beans, Camel, cattle and goat milk Game meat Camel and goat meat, Sugar Oil Wheat flour	Wild gum One type of wild fruit (Hohob)

General themes

- Diet based on cereal and milk
- Sorghum purchased in general but maize is an option – this may depend on the price of sorghum
- Price of maize and sorghum currently selling at the same price
- Use of purchased rice where possible
- Use of purchased wheat flour where possible
- Limited milling of whole grain cereals
- Limited use of purchased beans
- Milk intake according to availability from own production and to proportion sold
- Own goats used for meat consumption rarely (some said monthly), camels slaughtered on special occasions.
- Vegetables rarely or never purchased
- Game meat eaten by some households occasionally
- Wild fruits and leaves generally not available, one wild fruit was mentioned, there is some availablity of wild gum
- No fish consumption, considered a ‘town food’

Seasonality of food access and use

- Seasonal variation based around access to milk.
- Higher the milk intake the less cereal consumed
- Common reduction in cereal intake reported to be 50% - more likely for middle income households
- Highest milk availability and use during Gu season
- Lower sugar consumption for household, if milk is available
- Lower vegetable oil consumption by households during the rainy seasons
- If ghee is available to household, vegetable oil not used or used in very limited quantities
- Some consumption of meat during dry seasons
- Xabag gum available only at the end of rainy seasons

Estimations of fluctuations in nutrient availability by season and wealth group

Calculated for a household of 6 – see annex one

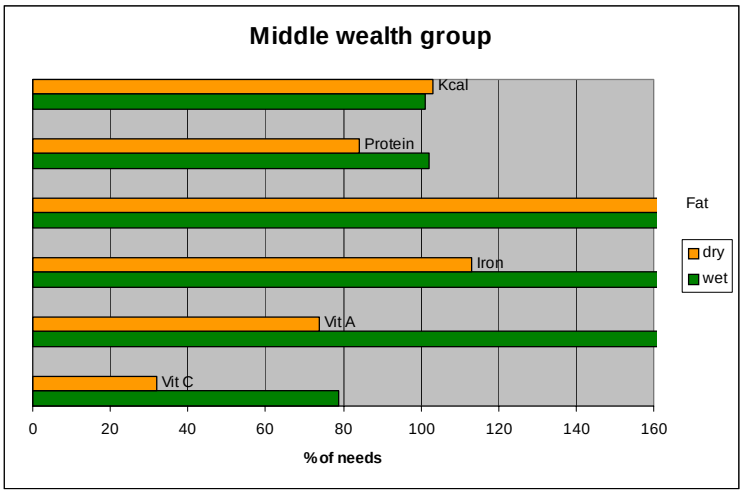
Wealth group	Dry seasons	Wet seasons
Middle	500g sorghum 500g rice 500g sugar 200ml oil 100ml ghee 2000ml camel milk 1000ml goats milk	500g rice 300g sugar 250ml ghee 5000ml camels milk 2000ml goats milk
Estimated coverage of requirements	total kcal, 84% protein total fat total iron 74% Vit A 32% Vit C	total kcal, total protein and fat, total iron and Vit A 79% Vit C
Poor	1000g sorghum 500g sugar 200ml oil 1000ml camel milk 500ml goat milk	1000g sorghum 300g sugar 200ml oil 100ml ghee 2000ml camel milk 1500ml goat milk
Estimated coverage of requirements	84% kcal, 75% protein total fat 79% iron 28% Vit A 16% Vit C	99% kcal total protein total fat total iron 74% Vit A 32% Vit C

Estimated fluctuations in nutrient availability for pastoral households in dry seasons (Jilaal and Hagau) and wet seasons (Gu and Deyr)

Average daily consumption shows insufficient availability of micronutrients for some of the year of middle wealth group households and all year for poor wealth group households. While energy and protein levels are only adequate or near adequate, fat availability is generally high due to the milk intake. Lost of nutrients from large quantities of cereals and from vegetable consumption as consumed by households in other FEZ is, in general, more than made up for in milk consumption. This is both due to the larger milk intake of this group compared to agro-pastoralists and to the fact that camel milk contains larger quantities of iron, vitamin A and C. Those households in the agro-pastoral case study consume cow milk and those in this study consume camel milk. While the emphasis on cow milk by agro-pastoralist and camel milk by pastoralists is common, the division is not complete. The choice of cereal has less of an impact on nutrient availability than for agro-pastoral households.

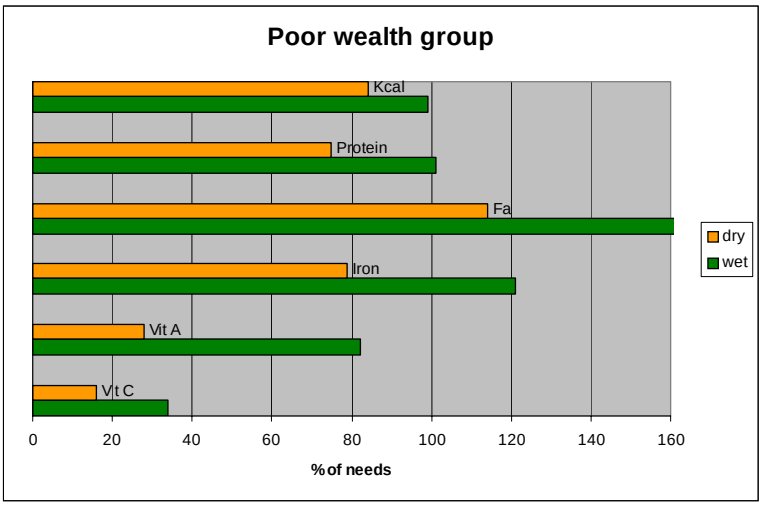
Middle wealth group

Seasonality has a large impact on nutrient availability for the middle wealth group, although dry seasons availability of micronutrients is not as poor as relation to other FEZs. Protein, vitamin A and vitamin C are all low for the wealth group during the dry season. The marked increase in micronutrient availability in the wet seasons it due to the increased consumption of camel milk. Kcal availability is only just adequate throughout the year. Reduction in cereal consumption is shown as 50%



Poor wealth group

All nutrients aside from fat are low for the poor wealth group in the dry seasons. Vitamin A and C are of particular concern due to both the limited milk availability for this group during the dry seasons and the lack of other additions to the diet such as vegetables. While there is substantial change in the wet seasons, the availability of vitamin A and in particular C is still low as consumption of milk by this group is not sufficient to cover all needs.



6.2.3

Focus on indications of difference in access, use and nutrient intake by wealth group

Main differences found between middle and poor households are milk consumption, lower for poor households in all seasons, and choice of cereal. All households show a strong preference for rice over locally produced cereals, although only middle income households tend to have the purchasing power in buy rice. The growing interest in use of wheat flour (considered by some as more of an 'urban' food by some) is also more likely to be purchased by middle wealth group households. Reduction in cereal consumption during the rainy seasons is more limited for the poor households due to a more limited milk supply for home consumption, however some reduction is normal. Total cereal consumption does not appear to be different for middle and poor households during the dry seasons.

Outside of different possibilities for cereal consumption in terms both of fluctuating levels and type used plus the difference in milk and ghee consumption, the food consumption of middle and poor households shows little difference. Neither wealth group shows more than a very limited or no use of purchased fruit or vegetables. Both wealth groups collect wild fruits and gum if available (this case study found this to be very limited in general). Middle wealth group is more likely to consume sugar in larger amounts. Meat from own production may be more limited for poor households but the evidence for this is very limited. Differences in consumption of bush meat are not known.

6.2.4

Focus on indications of prioritisation and difference in intake for household members

In common with all other FEZs the focus given by informants was on the prioritisation of children, particularly young children and infants within the household. This was mentioned in reference to allocation generally, in seasonal fluctuations of different foods and in times of food shortage. The subject is illustrated in pastoral households almost exclusively with reference to milk. When milk production declines children will continue to take milk after other household members have ceased. With limited milk supply it is reserved for the young children. If very limited it tends to be reserved for the youngest child, even or especially if that child is still breastfeeding as 'the others can eat adult food' i.e. grain. Limited milk is often given to infants and children diluted with water or in tea. Persons interviewed showed a strong preference for camel milk as it was considered by them to be give health (cafimaad). The exception was for infants under the age of 18 months to 2 years, who should be given only breastmilk or goat milk as camel milk makes infants vomit.

In common with agro-pastoral households, while children tend to be exempt in theory from eating only at regular meals as they cannot 'resist hunger' in the way that adults can, cooked food is not prepared for them outside of the 2 or 3 meals eaten by the whole family. In practice this means that 'extra meals' consist of milk if available otherwise tea. However 3 meals a day appear more common in households or extended family groups eating together with larger numbers of small children. Some households reported feeding their children rice even when adults ate sorghum or maize. Rice is considered both tasty in comparison to sorghum and easier to eat. While a preference for the whole family it is considered particularly good for children. No difference was found between reported consumption patterns of female and male children.

While lactating women should and do eat more than other women, pregnant women were reported to eat less than either lactating or other women. This was generally expressed as an 'inability' to eat more rather deliberate under consumption to restrict foetus size. No particular foods were thought to be good or bad pregnant or lactating women who eat the same meals as other household members.

The reported meal serving and groups of persons eating together varies greatly between different households and shows some relationship to the size of the household and shows a similar pattern to agro-pastoral households. Small households (one or two adult and a few young children) will tend to eat together, the mother aiding any young children. Households with larger numbers of children may serve them first, the couple eating afterwards (together). Some larger households serve the older males first (father and older sons), followed by the young children (mixed boys and girls), older girls and mother eating last. This last pattern may be more common in pastoral than agro-pastoral household and groups eating together may tend to be larger in general, although evidence is limited. No food avoidance was mentioned during illness.

6.2.5

Timing and meal frequency

Consumption of a meal at sunrise or soon after is dependent on the season. During the wet seasons the whole household will drink milk. The milk may be accompanied by cereal but this is generally considered unnecessary if there is a good milk supply. During the dry seasons the meal is generally cereal (either wheat flour or sorghum) and oil served with tea. Pastoral households most commonly cook one further meal a day but in some cases two (this many be more common in households with several young children). Milk and tea may be served outside the meal times, milk particularly to children. At least one meal a day will consist of cereal even in the wet season whether rice sorghum, maize or wheat flour. In the dry season it would be served with oil and very occasionally meat, in the wet seasons it will be served with ghee and milk.

Food preparation and meal composition

Milk – camel or goat milk may be consumed fresh or sour, while cow milk is consumed fresh (or made into ghee – see below). Milk may be used diluted or skimmed. Goat or other milk is added to tea when available. Tea always contains large quantities of sugar outside of cases of food stress. Goat milk is important for home use particularly for tea and to give to children.
Canjeero (Anjera) – may be eaten for the morning meal and is based on boiled, ready milled wheat flour with no or little sorghum added, oil poured on top, if ghee is available this will replace vegetable oil .
Soor – sorghum or maize porridge made by boiling milled sorghum or maize in water and adding the most finely milled cereal towards the end of cooking to bind, eaten with oil.
Garow (known as Ambulo in other areas) – whole maize with or without beans or whole sorghum with or without beans boiled in water and eaten with oil. Rice is commonly used after being boiled in water.
All of the above may be eaten alone with milk or meat (boiled or fried).

Processing, preservation and storage

Grain
Grain is purchased and so stored only for limited periods, no special techniques are used for storage. Grain is generally kept inside the home and carried by donkey or camel when the household moves to a new location.
Milling is less common in pastoral households than in riverine or agro-pastoral groups. Milling stones are used in settlements if near to the location of pastoral homes. Grain may also be bought ready milled for a higher price than whole grain.

Milk and meat
Milk drying is not practiced was confused with purchased milk powder. Some older men mentioned that this is an old tradition and they had not seen it practiced in their lifetime. This practice has however been documented as a more recent disappearance (AAH-UK 2001a) and as a rare but existing preservation technique (Pratt 2001) in other Somali groups. The milk is first allowed to ferment and the ghee removed, then boiled to allow most of the water to evaporate. The remaining paste is then dried in the sun, crushed then stored. The milk power would

then be saved for years of sub-normal milk production when it would be mixed with water. Ghee is produced from milk. Camel milk is not used due to it's low butter fat content.

Old men talked of camels slaughtered on ritual occasions if within the means of the household, following which camel meat dried. Meat is cut into thin 'ropes' and hung from trees where is dries. The thin strips are stored in a sack. Small pieces of dried meat are known as Mugumad. Dried meat can also be crushed and boiled to make soup.

Wild foods
No reported storage of wild foods. Hohod (rare) and xabag (gum) are consumed when found.

6.2.6

Response to food shortages

As with agro-pastoral households the response to food shortage tended to rests around the extension of the idea of prioritising young children. This appeared even more prevalent in pastoral household, which may be due to the importance of milk in consumption patterns and the perceived importance of milk to children. It should be noted that when pastoral (and other FEZs) comment that children are given prioritisation during food shortage or at other times they tend to be talking about children under the age of 4 or 5 years and infants rather than all children. It appears likely that a child of 8 or 9 years of age may be treated as an adult during a period of food shortage. When there is very limited milk all weaned children are likely to suffer with adults, very limited milk appears more likely to be given to breastfed infant rather than a weaned child.

Some respondents noted that they had drunk tea without sugar (in refugee camps in Ethiopia during the late 1980's and early 1990's) which is an indicator of food stress in the Somali context. They reported that they have not done this since return to Somaliland. Game meat appeared in some conversations as a food only eaten in response to food shortage, in others it appears as a food eaten in normal years.

6.2.7

Focus on indications of change over time

Most response focused on increasing inability to purchase the more expensive cereal products over cheaper locally produced cereals. When asked to look back over past consumption patterns younger informants were less able to identify differences in consumption patterns, older informants always mentioned less access to rice first. More limited milk and ghee were also mentioned although less frequently than access to rice. Currently rice is more likely to be consumed by children than the whole family by households who cannot afford to purchase larger quantities of rice. Rice is not considered more healthy than other cereal rather better due to the taste (dhadhan). It is considered good for children and old people, as it is easier to eat, the difference in cooking time was also mentioned.

Reasons given for these changes were drought leading to asset loss and asset loss in the late 1980's during looting and displacement to Ethiopia. More recent change focused on the more limited purchase of wheat flour and rice than before the livestock ban, which has lead to reduced purchasing power. Wheat four may be a more recent addition to pastoral diets than rice.

For some Hawd pastoral households the effects of drought and displacement leading to livestock loss has been substantial enough to encourage settlement of pastoral households increasing the numbers of agro-pastoral households in the area. Households visited had settled between 2 and 30 years ago and all mentioned declining livestock numbers as the primary reason. The effect on consumption shows the basic elements of the agro-pastoral diet as highlighted by the agro-pastoral case study based on agro-households in Hiran.

· Consumption of cow milk is more common than camel milk
· Milk is, in general, more limited than for pastoral households
· Vegetable consumption is limited but more common than for pastoral households (in the case of North West agro-pastoralist this is more likely to be own production than purchase)
· More maize is consumed by agro-pastoral households than pastoral households

6.2.8

Perceptions of malnutrition – perceived cause and responses

Pastoralists interviewed considered that more malnutrition would be found in the grazing areas than in settlements or towns, because in towns availability of different foods is greater than in grazing areas. Whether this is an acknowledgement of the advantages of dietary diversity is not completely clear. No acknowledgement was given to the problem of access (due to purchasing power) to the range of foods. It was also mentioned that in towns 'medicine' was available which could 'help with' (prevent or cure) the problem of malnutrition. It seems the 'medicine' referred to was vitamin supplement syrup.

Despite the references to vitamin supplements and diversity of foods mentioned most comments on the causes of malnutrition centered on lack of quantity of food but also lack of nafaqo or 'nutrition' (described as 'what is needed to be healthy' – sorghum and milk were given as examples). Non-specific disease was also mentioned as a possible cause. Malnutrition is often linked with the idea of weak or lack of blood (dhiig yaraan – often translated as anaemia). This condition can manifest itself as physical weakness, lack of energy and insomnia. The condition can be caused by lack of food and therefore lead to malnutrition. Weak blood can also make an individual more susceptible to malnutrition. It is possible to tell if someone is suffering from malnutrition as 'when they try to get up they fall down'.

Risk of malnutrition was said to be highest in households with the least livestock and within these households to old people and children. As the basic known cause is lack of food the level of possible response was acknowledged to be low as 'little can be done if food is not available to the households'.

6.2.9

Implications of above information in terms of likely contribution to malnutrition

· Average daily consumption in all seasons shows insufficient availability of some nutrients for the middle wealth group during the wet seasons and insufficient availability of some nutrients for the poor wealth group all year.

· Energy consumption, outside of periods of food stress appears to be just adequate or near adequate. Energy availability is low for poor households and inadequate for the very poor. Energy availability appears lower for pastoral household than for agro-pastoral household due to the more limited quantities of cereal consumed all year and to the large reductions during the wet seasons. It is likely that further attention needs to be paid to the possible impact of labour intensive periods of agricultural work due to its impact on energy needs of those members of the household working.

· Nutrient availability shows a relationship with socio-economic group with the poor showing greatest deficits.

· Lack of purchasing power limiting the purchase of rice and pasta is likely to be of more benefit than harm as many nutrients are lost through use of such refined products. However highly milled rice contains little fibre and therefore can be digested and absorbed easily which is an advantage for young children. Cereal choice is likely

to have a more limited impact on pastoral households than on agro-pastoral households as cereal is less central to the diet as a whole.

· Under-nutrition becomes a serious issue when purchasing power falls below a level where adequate cereal supplies of any kind can be purchased for the household, this is not uncommon particularly in poor households and is common place in very poor households. The move towards an agro-pastoral lifestyle and therefore to agro-pastoral consumption patterns is a common strategy for pastoral household who are unable to met their needs.

· Vitamin C availability is low in the poor pastoral diet and low for middle wealth group pastoral households during the dry seasons. The availability of micronutrients is higher than for agro-pastoral households despite the lack or vegetable due to the availability of milk, in particular to camel milk. The actual *intake* of micronutrients is likely to remove the pastoral diet further from the agro-pastoral diet, as there is no loss through cooking.

· No food taboos were identified which restrict food intake for particular household members but there is strong evidence of general under consumption by pregnant women.

· Pregnant women from both wealth groups are likely to suffer from low iron intake during the dry seasons as availability is low for the household as a whole, no extra allowance of iron rich foods are given to pregnant women and their iron needs are high.

· Reported consumption patterns privilege children over adults, particularly young children but other research (outside Somalia) has shown young children may receive food intakes which are lower in relation to their requirements than other household members, as the exceptionally high food requirements per kg of small children is not fully appreciated (for example Abdullah and Wheeler 1985). Using recall methods it is not possible to examine this idea.

Implications of above information as a basis for the design of interventions

· Access to pastoral households is a major problem for any kind of intervention

· Educators should only recommend nutrition guidelines, which are practical and acceptable to the community, which seriously restricts possibilities in this area.

· The promotion of consumption of vegetables unlikely to be practical were access to markets is limited and infrequent, as is normal for pastoral households.

· Increased stock may increase the milk availability and would likely increase milk consumption therefore nutrient availability particularly for poor households. This is not an inevitable consequence as milk may also be sold in order to purchase more expensive cereals. Goat milk is least likely to be sold. Any kind of restocking programme raises questions of efficacy and effectiveness in drought prone areas.

6.3 RIVERINE CASE STUDY

6.3.1

Name of food economy zone represented by the case study:

Hiran Riverine: sorghum, maize, cattle and shoats (see Food Economy Zone map)

Description and location of the group interviewed:

Three riverine villages were visited in the Belet Weyne district if Hiran region. Two villages Luqdhere and Balo Rado are on the east bank of the Shabelle river, north of Belet Weyne town. Dolo Qoyan is found on the west bank of the river to the south of Belet Weyne. Most villages on the west bank, including Dolo Qoyan are Bantu. On the east bank, villages are predominantly Bantu although also include members of other clans. Main crops grown are maize and sorghum intercropped with beans or cowpeas. Vegetables, mainly tomatoes and onions are grown for both consumption and sale, some sesame is also grown. In common with other riverine villages agriculture in both rainfed and irrigated and livestock holding are small.

Likely level of representation of the food economy zone and livelihood system as a whole:

The above villages are likely fairly representative of the Hiran riverine food economy zone. Neither of the villages to the north of Belet Weyne have fruit trees, this is likely make a significant difference to fruit intake and therefore micronutrient availability when compared to villages with fruit trees. This is likely to be the case for all households within a given village, even those households without trees. This is due to the low price of such products within villages where they are produced.

Destruction of irrigation systems during the 1997/8 floods is common to all riverine FEZs. Rainfall is more reliable in Middle Shabelle area than in Hiran and may aid the production of more diversified crops for a larger proportion of the FEZ, in turn meaning potentially higher availability of micronutrients. The amount of working irrigation systems in Hiran compared with those in villages on the Juba river appears greater. Current irrigation, outside of large private farms, in northern Juda river areas is very limited meaning very limited or no vegetable consumption.

Particular constraints for information collection:

One of the two interviewers noted interview fatigue as a problem in riverine villages. Limits to the number of community members at the village site and available to interview was a restriction for the riverine case study but this was less of a restriction in comparison with agro-pastoral and pastoral case studies.

6.3.2

Food list relevant to the case study

Foods mentioned in the food list and regularly appearing in diet recalls and interview data	Foods included on the food list as available to the group but not mentioned as a regular feature of household consumption
Maize sorghum, Beans and bean leaves Goat, cow and camel milk Game meat Camel meat Sugar Vegetable oil Wheat flour Rice Tomatoes Onions Green pepper Fish Wild leaves (Kable, Ransow, Carmo-Aran)	Shoat meat and beef Groundnuts Honey, Sweet potatoes, Potatoes, Bananas, Mango, Watermelon, Chicken Pasta Wild fruits: Hanshile (unknown), Madaruk (unknown), Hohob, Jicib, Dheen, Mareer

General themes

· Diet based on cereal, either maize or sorghum, most commonly maize
· Cereal from own production and purchase
· Use of purchased wheat flour and rice where possible
· Preference for milling both maize and sorghum, although whole grain also consumed
· Some use of beans from own production
· Use of vegetables (mainly tomatoes and onions) by all households, either from own production or purchased in the village.
· Milk consumption according to avilability from own production (limited) and possibility of purchase
· Game meat consumption by many households, may be hunted by those within the community or purchased
· Purchased meat most likely to be camel meat as sold at a lower price than other meats
· Wild leaves readily available, collected and consumed by many, but not all, households
· Fish consumption in some households only, in many cases eaten by children only.
· Some wild fruit consumption
· Other fruit consumption limited in villages with no fruit trees
· Limited availability of honey

Seasonality of food access and use

· Seasonal variation limited
· Higher milk consumption during wet seasons, due to very limited livestock holdings this milk may be purchased when prices are low in the wet seasons
· Some households reported lower sugar, oil and cereal consumption when milk is available but large enough quantities of milk to allow significant reduction in other goods is not a regular feature of riverine consumption patterns.
· Wild leaves are available during the wet seasons and are consumed in many households
· Meat more likely to be consumed during the dry season
· Wild fruits available and consumed by some households, in limited amounts during dry season
· No seasonal variation in fish eating found

Estimations of fluctuations in nutrient availability by season and wealth group

Calculated for a household of 6 – see annex one

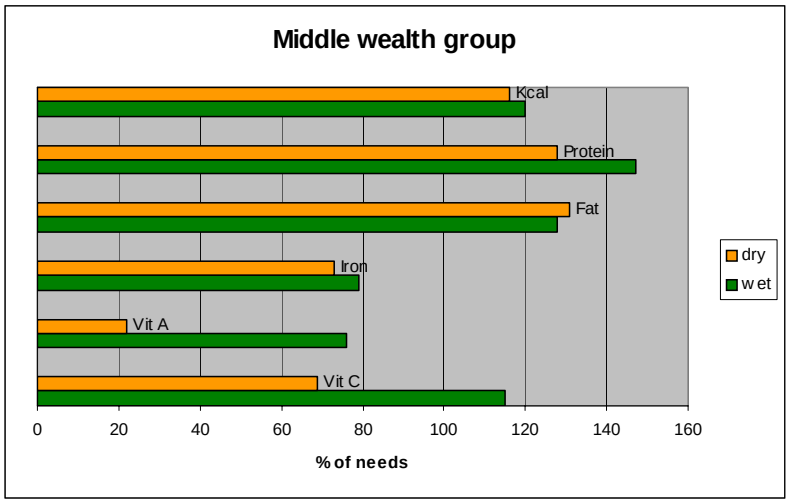
Wealth group	Dry seasons	Wet seasons
Middle	1000g maize flour 500g wheat flour 200g sorghum 500g tomatoes 100g onions 250g beans 250ml oil 300g sugar 300ml goats milk (250g meat twice weekly)	1000g maize flour 500g wheat flour 200g sorghum 500g tomatoes 100g onions 100g wild leaves 200ml oil 300g sugar 750ml goats milk 500ml cows milk
Estimated coverage of requirements	Total kcal Total protein and fat 73% iron 22% Vit A 69% Vit C slight increase in macronutrients and iron when meat is consumed	Total kcal Total protein and fat 79% iron 76% Vit A Total Vit C
Poor	1500 maize 500 tomatoes 100g onion 200g oil 250g sugar (beans or meat added once or twice weekly)	1500 maize 500 tomatoes 100g onion 100g wild leaves 200g oil 250g sugar 500ml cows milk
Estimated coverage of requirements	83% kcal 74% protein Total fat 46% iron 16% Vit A 67% Vit	87% kcal 86% protein Total fat 51% iron 63% Vit A Total Vit C

Estimated fluctuations in nutrient availability for riverine households in dry seasons (Jilaal and Hagau) and wet seasons (Gu and Deyr)

Average daily consumption shows insufficient availability of some nutrients. Macronutrient availability appears dependant on wealth while micronutrient availability shows fluctuations based on seasons for both wealth groups.
Small seasonal differences are found in the macronutirent and iron availability by season. In comparison to the pastoral and agro-pastoral diets, riverine household consumption shows little variation according to the seasons. Changes that do exist create a marked difference in vitamin availability. The larger differences in vitamin availability is due to the introduction of wild leaves in the wet season, in should be noted that some households reported that despite the availability of leaves they did not consume them. Increased milk consumption also makes a contribution to increased vitamin A availability.
As vegetable production is not directly related to the dry and wet seasons (as irrigation is used and vegetables are regularly harvested during the year) vegetables use (aside from wild foods) is fairly consistent throughout the year.

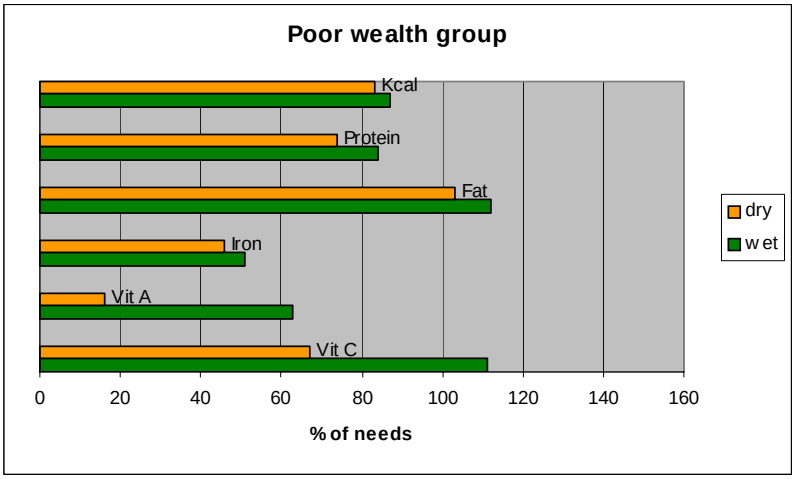
Middle wealth group

The middle wealth group is more likely to use wheat flour than the poor, occasional use of rice is also common. Iron availability is higher for this group despite use the wheat flour as more cereal in general tends to be used with the addition of beans.
The middle group has less difficulties meeting their basic energy needs than the poor. Higher vitamin A availability is due to the larger quantity of milk available to these households.



Poor wealth group

Poor households have difficulties meeting basic energy and protein needs. Reported cereal intake was relatively consist through the year but is below the minimum requirement.
Slight increases in macronutrients during the wet seasons reflect the limited introduction of milk.
Vitamin C availability is better for this group than other poor wealth groups due to vegetable consumption. This is also reflected in comparison between vitamin A consumption of poor agro-pastoral and riverine.



6.3.3

Focus on indications of difference in access, use and nutrient intake by wealth group

The middle wealth group households tend to have higher availability of all nutrients than poor households. Middle households consume both larger quantities of foods and tend to consume a greater range of foods. Unlikely agro-pastoral households, large differences are not found between middle and poor households in terms of vegetable use. This is a reflection of the low price at which vegetables can be purchased within riverine villages. Tomatoes could be purchased in riverine villages for a ¼ of the market price during the field study. The price difference together with the physical accessibility of vegetables makes them a serious option for daily consumption even for households that do not produce vegetables. No difference was found between middle and poor households regarding the likely consumption of wild foods. As a consequence of this wealth groups show larger differences in energy and protein levels than in vitamin availability.

Purchased goods such as sugar and oil do show some difference, being more limited for poor households than the middle wealthy group. Poor households often need to purchase basic cereals making them more likely to restrict the purchase of additional goods. Milk consumption is lower for poor households, most of whom will have to purchase what they do consume. Middle wealth group households will either consume milk available from own consumption or a mixture of own production and purchase.

Total cereal consumption and therefore total energy available to the household shows some variation between middle and poor households. It is a clear difference between middle and very poor households. While seasonal change in diet is more limited for poor households the likelihood of fluctuations in total food intake is more likely as their resource base and purchasing power is more limited. Where a household member is unable to gain income due to illness or lack opportunities or if expenses are incurred through illness this is more likely to have an influence on the total food basket than for middle households.

The use of whole sorghum or maize rather than milled cereal is more common in very poor households than in other households. In other households at least one meal a day will be prepared with milled cereal. Middle households are more likely than poor to prepare canjeero as a morning meal, while wheat flour is used, in the riverine villages it tends to be mixed with sorghum flour.

6.3.4

Focus on indications of prioritisation and difference in intake for household members

The clearest difference in intake between adults and children in many households is the consumption of fish. Although in some households fish is eaten occasionally by all members of the household in others the subject of fish eating was greeted with distaste and respondents stated they would not eat it under any circumstances. Children are well known to be the household members that generally catch fish in riverine areas of Somalia. They also appear to be the most likely consumers. Some mothers stated they cooked fish for their children but would not eat it themselves, others said the children prepared fish themselves or ate at another house. Other wild foods have a more equal distribution among household members, although those who collect fruits tend to benefit the most from it.

The prioritisation of children, particularly young children and infants within the household was a strong theme is this case study. This was mentioned in reference to allocation generally, in seasonal fluctuations of different foods and in times of food shortage. Although access to and consumption of milk is limited for the riverine group, as with the pastoral and agro-pastoral groups, the theme was often illustrated with reference to milk. When milk production declines children will continue to take milk after other household members have ceased. A limited milk supply is reserved for the young children. There is a preference for cow milk over camel milk for children as the later is considered too strong and gives them diarrhoea. No difference was found between the

allocation of food between male and female children. Children consume tea with milk when possible between the meals taken by all household members as well as fruit if available.

Although the prioritisation of those who perform more strenuous tasks was ever mentioned, the idea of the need (for the household as a whole) to have access a large quantity of food as they 'work hard in the fields' was often mentioned. Some mothers commented at a midday meal may be cooked but it would not necessarily be eaten by all household members, the adult males and older children being most likely to be working in the fields. Those out working would eat only the evening meal during busy periods. For those without irrigated land, and particularly when rainfed crops are doing badly, absences for the home are longer term. Some household members are away selling labour, fodder or bush products for days at a time. These household members must 'look after themselves' when they are away from the home. It is most often the case in poor households. This highlights the problem of accounting for meals taking outside the home and means the food cooked inside the home may often be consumed by a smaller group of people thus provided them with a higher coverage of nutrients.

In general pregnant women were said to eat the same foods as other household members. Most commented that it was normal to eat less than when not pregnant because the belly was so 'full with the baby'. Deliberate under consumption to restrict the growth of the foetus was not explicitly mentioned but appears very likely. Lactating women *are* generally considered to eat more than other women as 'she is eating for herself and the baby'. Pregnant women should not consume vitamin supplements (accessible and popular in Somalia). This is likely related to a connection made to foetus growth. Pregnant women like to eat (and should when possible) 'tasty' food including liver and milk. No particular foods were mentioned in relation to lactating women.

The reported meal serving and groups of persons eating together varies as greatly as for the pastoral and agro-pastoral groups. As with those groups it shows some relationship to the size of the household. Small households (one or two adult and a few young children) will tend to eat together, the mother aiding any young children. Households with larger numbers of children may serve them first, the couple eating afterwards (together). Some larger households serve the older males first (father and older sons), followed by the young children (mixed boys and girls), older girls and mother eating last. The only reasons given for this order were of a pragmatic nature 'women eat last because they are busy serving'. If a household member is ill they may not be able to eat 'normal foods' and should be given foods that are easy to eat like milk. When possible they should also be given 'foods they like' in order to encourage them to eat. No food avoidance was mentioned during illness.

6.3.5

Timing and meal frequency

All but the poorest households consume something at sunrise or soon after. At the most limited this is tea but commonly a meal made from cereal and oil in the dry season or milk in the rainy season if the household has a milk supply. The timing of further cooked meals is dependent on what work is being completed and how long much time was being spent away from the home. As previously noted, some mothers commented at a midday meal may be cooked but it would not necessarily be eaten by all household members, the adult males and older children being most likely to be working in the fields.

Food preparation and meal composition

Milk – may be consumed fresh or sour, if cow milk only fresh, goat or other milk is added to tea when available. Tea always contains large quantities of sugar outside of cases of food stress.

Canjeero (Anjera) – commonly eaten for the morning meal and is based on boiled, ready milled wheat flour with sorghum added (sorghum may be up to 50% of total four), oil poured on top.

Iskukaris – rice, tomatoes and meat cooked together. Wild leaves may be added.

Soor – sorghum or maize porridge made by boiling milled sorghum or maize in water and adding the most finely milled cereal towards the end of cooking to bind, eaten with oil.

Cambulo – whole maize with or without beans or whole sorghum with or without beans boiled in water and eaten with oil (traditionally sesame oil). Wild leaves may be added.

Soor and Cambulo may be eaten alone with milk or meat (boiled or fried) or with Dalabilash – a source made from boiled, then fried tomatoes, it may also contain onion.

All cereals absorb nutrients when they are cooked which increases volume or bulk but decreases the concentration of energy and nutrients. The long cooking time of tomatoes and wild leaves used to prepare dalabilash will cause nutrient loss.

Processing, preservation and storage

Grain
While informants in two villages reported past use of bakarr, in one village the use of underground grain storage had, reportedly, never been practiced. No current use was recorded.
Preference is for milled grain flour over whole grain. While cooking time is an issue, taste is most frequently mentioned as the reason. Wheat is bought ready milled, milling of sorghum and maize is generally completed at the home or nieghbours using a pestle and mortar then a grinding stone. Some prefer to eat maize if consuming whole grain. Milling removes a large proportion of fibre, minerals and vitamins along with some of the proteins. However some account should be taken of the young child's inability to digest and absorb nutrients from diets containing too much fibre (Cameron and Hofvander 1983 :53).

Milk and meat
Milk drying is not practiced. No household was found that produced ghee. This is much less common than in agro-pastoral or pastoral groups. Meat drying was said to be occasionally practiced.

Wild foods
No reported storage of wild foods. Wild foods mentioned were either fruits (eaten raw either while herding and gathering firewood or brought back to the settlement and eaten that day or the following day) or leaves collected and eaten the same day.

6.3.6

Response to food shortages

Giving children food first was a common theme and the issue of children being unable to resist hunger that appeared in the agro-pastoral case study also appeared here. Another common theme is the similar nature of the very old and very young in terms of needs. The individual nature of exact response to food shortage was repeatedly mentioned and was noted to be related to the particular circumstances within a particular household. Absences of some household members from the home to sell bush products was noted as more prolonged during times of food stress.

Foods listed as the first to be limited were all purchased items such as rice, wheat flour, sugar and oil. Vegetable consumption is likely to be lower or absent as irrigation is likely to be limited or stopped during economic hardship. If food consumption needs to be reduced this may mean a reduction in the number of meals or amounts within them or a combination of both.

6.3.7

Focus on indications of change over time

Most interviewees noted that changing food consumption over time was strongly connected to life cycles. New mothers noted that they now concern themselves with their children rather than themselves, elders commented that these days they just 'get what they are given' rather than making choices about meals themselves.

Many informants reported lower milk consumption as a result of falling livestock numbers. The last use of underground storage for harvested grain was around twenty years ago (some younger informants had not heard of it at all). Specific reasons for this change are not completely clear although does follow a general pattern of declining storage. This was not directed connected to change in consumption patterns by those interviewed.

6.3.8

Perceptions of malnutrition – perceived cause and responses

Malnutrition was strongly related to lack of *quantity* of food in discussions but non-specific disease was also mentioned as possible cause. Several women mentioned that illness could cause a person to 'become thin'. They commented that they know this from observation within the village. Food type was also an issue, lack of milk was mentioned repeatedly. A strong interest in vitamin supplements was found. When asked whether foods also contained vitamins and if so which foods they were, respondents were unsure but considered that possibly milk and sorghum contain vitamins. 'Lack of vitamins' was thought by some to cause malnutrition.

A person is known to be suffering from malnutrition primarily if they are thin and have no energy to work. Lack of appetite, weakness, inability to walk well, loose hair or hair that changes colour, lack of blood, big belly, pale face, swollen feet, hand and legs were also mentioned.

Malnutrition is known to mainly affect children and the elderly because they are not strong and need 'more attention in terms of food'. Adult males are generally though to be stronger and more likely to 'withstand' lack of food and therefore less likely to suffer from malnutrition. The age when someone could be considered 'strong' was reported to be around 40 years. A few women considered that adult men were at risk from malnutrition as they worked hard and had 'no time to eat'. Respondents also found clear connections between malnutrition and socio-economic group. Eating enough food and medicine (specific medicine not known but perhaps a further reference to vitamin supplements) prevents malnutrition.

If someone is suffering from malnutrition most respondents considered that that person should be taken to a doctor in the town to receive 'advice and medicine'. It was not known what this advice would be or what the medicine would be. Another reason to 'go to town' was because more milk and also liver was available there which are both good to eat if you have malnutrition.

6.3.9

Implications of above information in terms of likely contribution to malnutrition

· Average daily consumption in all seasons shows insufficient availability of some nutrients in both wealth groups. Particular problems include dry season vitamin A deficiencies for both groups and deficient energy and protein level of the poor all year.

· Energy consumption, outside of periods of food stress appears to be adequate or near adequate for the middle wealth group to most reported consumption at sites visited. Energy availability is low for poor households and inadequate for the very poor. It is likely that further attention needs to be paid to the possible impact of labour

intensive periods of agricultural work due to its impact on energy needs of those members of the household working. Absences from the home by some household members may also be a factor with some impact.

· Nutrient availability shows a strong relationship with socio-economic group with the poor showing greatest deficits. Under-nutrition becomes a serious issue when purchasing power falls below a level where adequate cereal supplies of any kind can be purchased for the household, this is not uncommon particularly in poor households and is common place in very poor households.

· Micronutrient availability is low in some cases in the riverine diet, however the diet does show greater diversity than the agro-pastoral and pastoral diets. The use of vegetables (and fruits in some cases) increases the availability of micronutrients. Cooking time of vegetables decreases the availability of micronutrients. Cereal-based diets reduce the percentage of available iron absorbed by the body.

· Increased availability of milk during the rainy seasons increases the availability of vitamin A, but this increase is limited.

· While riverine are more likely to use both fish and wild leaves than agro-pastoral and pastoral households, many respondents reported that they did not consume fish or wild leaves. This was most common in the case of fish.

· Strong evidence of pregnant women limiting food intake was found, in most cases this was found to be food in general rather than specific foods.

· Pregnant women suffer from low iron intake as availability is low for the household as a whole, no extra allowance of iron rich foods are given to pregnant women and their iron needs are high.

· Reported consumption patterns privilege children over adults, particularly young children but other research (outside Somalia) has shown young children may receive food intakes which are lower in relation to their requirements than other household members, as the exceptionally high food requirements per kg of small children is not fully appreciated (for example Abdullah and Wheeler 1985). Using recall methods it is not possible to examine this idea.

Implications of above information as a basis for the design of interventions

Food-based interventions using a combination of agricultural and education strategies deserve attention yet limited of experience in promotion, implementation and evaluation of programmes is clear. Some interventions in southern Somalia have focused on extending or improving irrigation systems and increasing yields in riverine areas. Much wider options are available in the riverine context in terms of agricultural programming than in the agro-pastoral context. Access to a more diverse range of foods and consumption of those foods can be improved in communities even for households that do not benefit directly from agricultural improvements.

Educators should only recommend nutrition guidelines that are practical and acceptable to the community, which restricts possibilities in this area. Participants in this study showed a lack of information on the nutritional value of foods but some interest in the subject.

Education on the value of accessible foods may go some way to increasing the use of them within the communities. Further study of why particular foods (for example fish and to some extent green leaves) appear well used by some households and not within others would be of benefit here. Particular attention needs to be paid to the promotion of green leave use particularly with reference to pregnant women. Note should be taken of the local assumption that anything ‘nutritious’ or ‘with vitamins’ creates the undesirable excessive growth of the foetus.

The promotion of small animal husbandry in order to increase the milk availability would be welcomed but raises questions of efficacy and effectiveness in drought prone areas.

6.4 Urban case study

6.4.1

Name of food economy zone represented by the case study:

Hargeisa Urban (see Hargeisa town marked on maps in annex one)

Description and location of the group interviewed:

Poor households with either no own production or very small numbers of zero-grazed small stock living in Hargeisa town in Somaliland.

Likely level of representation of the food economy zone and livelihood system as a whole:

Much less is known about the urban group than the pastoral, agro-pastoral or riverine in Somalia. The Hargeisa urban group is the only group to have had a baseline food economy profile made (one of those made in 1998), no other urban profiles are available. Wealth ranking it not well developed for urban groups in Somalia, the households described in this case study should be considered poor, although within this group some variation is seen.

Hargeisa town was badly damaged by the government (1988-90) and most of the urban population fled during that period either to rural relatives within Somalia or to eastern Ethiopia. A second major displacement occurred the end of 1994. Current peaceful conditions have encouraged return to Hargeisa. The changing demography of the urban poor in Hargeisa is not well understood. A process of increased settlement in towns has been noted in Somalia in general. This settlement tends to increase the numbers of urban poor as poor pastoral households who have lost livestock move towards a more settled lifestyle in order to look for labouring or trading possibilities. This may be a process more in evidence in southern Somalia than in Somaliland. Considerably more regeneration is apparent in Hargeisa town than in towns in southern Somalia. This may in turn mean more labour and trade opportunities than in southern towns. It is possible that at least some of the poor in Hargeisa have greater possibilities for meeting food needs than in southern towns.

Particular constraints for information collection:

The interviewer noted occasional incidences when potential respondents refused to cooperate due to interview fatigue. Some expressed the feeling that many questions had been asked and no tangible results had been seen.

6.4.2

Food list relevant to the case study

Foods mentioned in the food list and regularly appearing in diet recalls and interview data	Foods included on the food list as available to the group but not mentioned as a regular feature of household consumption
Maize sorghum, Beans Goat, cow and camel milk Shoat and camel meat Sugar Vegetable oil Wheat flour Tomatoes Onions potatoes Rice Pasta	Groundnuts Carrots Honey Bananas Watermelon, Chicken

General themes

· Diet based on cereal
· Cereal and most or all other food products are purchased
· Use of wheat flour and rice and pasta where possible
· Preference for milling both maize and sorghum, although whole grain also consumed
· Use of vegetables is limited in quantity but is a regular feature of consumption in many households.
· Limited milk consumption from own production is a possibility for some households that have small numbers of zero grazed small stock. Otherwise milk is purchased.
· Meat consumption is limited but small amounts of meat (particularly camel meat) are used. Meat is not consumed daily.

Seasonality of food access and use

· Seasonal variation appears to be limited
· Higher milk consumption during wet seasons, is the main change in consumption patterns due its low market price.
· This change is unlikely to be as large scale as the change found in agro-pastoral or pastoral groups
· Whether increased milk consumption effects the purchase and therefore consumption of other products is a subject for further study
· While seasonal variation appears subtle for this group, the seasonal price of different goods (in specific geographical areas) as well as consumer's reaction to these differences will aid a fuller picture to be developed.
· Note of the interaction between non-seasonal price changes (for example the inflated price of imported goods) and seasonal price difference further complicates the picture.

6.4.3

Focus on indications of difference in access, use and nutrient intake by wealth group

The larger and more stable the income for an urban household the more likely sufficient quantities of food available to the household and the more likely that the range of foods is greater. The lower the income the larger the proportion of energy provided by cereals. The lower the income the more likely the cereal is sorghum or maize rather than rice of pasta although some poor households do purchase rice to save on cooking time and fuel. Meat and vegetables tend to be added to a meal by poor households in small quantities. Meat may be used once a week and vegetables once or twice. Food may be purchased on a daily basis with the money earnt the same day. If more money is available than necessary to cover basic cereal needs a more expensive product, rice or pasta may be bought in its place.

6.4.4

Focus on indications of prioritisation and difference in intake for household members

The prioritisation of children, particularly young children and infants within the household was a again a strong theme. This was mentioned in reference to allocation generally, in seasonal fluctuations of different foods and in times of food shortage. Children are reported to be fed before adults in many households. Some households separate adult males and females (females eating after males), this tends to be in larger households. In small households where there are no young children, married couples may eat together following their children. The generally limited milk supply is reserved for the young children. Children consume tea with milk when possible between the meals taken by all household members as well as fruit if purchased.

Pregnant women were said to need to eat liver and milk because they are 'nutritious foods rich in vitamins and proteins'. Whether the pregnant women actually consumes such foods is dependent on the economic circumstances at the time as both foods are costly relative to cereals. Informants stated that a pregnant woman should eat less or the same quantity of food as other women. Lactating women are thought to benefit from more food in general and in particular more meat and milk.

6.5.5

Timing and meal frequency

Following an early morning meal of either tea or tea and cereal, timing and meal frequency is dependent on the activities of the household members in similar ways as for the riverine. Labouring or petty trade take some household members away from the home during the daytime. In cases were no adult members are at home during the day, younger children are left with relatives or neighbours, or with older children. The poorer the particular household the less likely that a midday meal with be served. Again the question of measuring food intake outside the home and snacking behaviour is raised.

Food preparation and meal composition

Meal composition was found to be similar to the other FEZs. Canjerro (Anjera) is likely to be consumed more often in urban environments than in rural settings, meaning higher purchase of wheat flour for this group. Cereal is more likely to be accompanied by meat than in other groups. Vegetables are also more likely to accompanied cereals than in the agro-pastoral and pastoral groups. This group uses less milk than the agro-pastoral and pastoral groups.

Processing, preservation and storage

The urban group practice very little preservation and storage as food is purchased on a regular basis from the local market. Grain may be milled at the home or purchased ready milled.

6.4.6

Response to food shortages

As noted, many poor urban households face frequent fluctuations in possibilities to buy food. Changes occur both as a result of unstable employment or petty trade possibilities as well as the changing price of foods on the market. Access to credit and remittances are mitigating factors but less likely to be available to the poor than to other urban wealth groups. Where credit is not available or is no longer available, eating cheaper foods and reduction of total food intake is the common response.

6.4.7

Focus on indications of change over time

The kind and extent of change in consumption patterns over time for the urban group is partly dependant on whether the household has been a long time member of the urban group or has moved to an urban area from another FEZ. Households from a pastoral background will show the largest change in consumption patterns while those from the urban setting will have seen less change in their consumption patterns. Those from within Hargeisa town noted that increased food prices prevented them from purchasing cereals of their choice, meat and milk was also considered more expensive than in years past.

6.4.8

Perceptions of malnutrition – perceived cause and responses

While the urban group reported both symptoms of malnutrition and identification of groups most at risk in a similar way to the other groups, prevention and particularly cure tended to focus more on benefits from outside intervention such as food aid and job creation than the other groups

6.4.9

Implications of above information in terms of likely contribution to malnutrition

· It is likely that average daily consumption in all seasons has insufficient availability of some nutrients.

· Availability of adequate food is heavily dependent on the vagaries of access to cash through employment or petty trade and purchasing power in the market place. This is likely to cause fluctuations in consumption patterns.

· Micronutrient availability is lowered in cases where cash is limited and prices high. The already limited purchase of vegetable ceases before purchase of cereals, sugar or oil is reduced.

· Increased purchase of milk during the rainy seasons increases the availability of vitamin A, but this increase is limited.

· Reported consumption patterns privilege children over adults, particularly young children but other research (outside Somalia) has shown young children may receive food intakes which are lower in relation to their requirements than other household members, as the exceptionally high food requirements per kg of small children is not fully appreciated (for example Abdullah and Wheeler 1985). Using recall methods it is not possible to examine this idea.

Implications of above information as a basis for the design of interventions

· Increasing purchasing power is the biggest challenge faced. Serious attention needs to be paid to programming that will increase the possible of sustainable livelihoods within urban areas as indications are that this is a growing group.

· Small scale food-based interventions could be explored with reference in the urban poor using a combination of agricultural and education strategies. The possibility of small-scale home production of vegetables to increase access to mirconutrients deserves attention.

· Educators should recommend nutrition guidelines that are practical within this group where purchasing power is limited. Further study is necessary considering the realistic options the urban poor have as consumers.

· Education on the value of accessible foods may go some way to increasing the use of them within the communities. The urban group does not generally suffer from limits in the availability of a range of foods rather limits in their ability to access this food.

7 COMPARATIVE ANALYSIS OF CASE STUDIES AND CONCLUDING REMARKS

Strong similarities are identified in a comparison of the four food economy groups studied, some of these similarities are found in a comparison of diet and nutrient availability, many are found at the level of the understanding of food and nutrition. Differences are also apparent, most clearly in seasonal variation in diet and in possibilities for interventions to address particular problems. This final section aims to highlight some of these comparative points. *Gaps in information and possible points for further study are found in italics.*

Nutrient sufficiency at household level

· The case studies reveal consumption patterns that, outside of times of particular food stress, provide the minimum or less than the minimum nutritional requirements to a household.

· This is the case across the four food economy groups.

· Some households in all food economy groups have difficulties meeting basic household energy requirements.

· Protein levels appear to be adequate or near adequate except in the case of poor riverine households.

· Fat levels are adequate outside of cases were reduced cereal intake is not fully compensated for by milk intake as shown in the case of poor agro-pastoral households.

· Riverine and possibly the urban poor consume a greater range of foods than either the agro-pastoral or pastoral group. In the absence of a good milk supply (in the dry season for pastoral and all year for poor agro-pastoralists) this range means the availability of vitamin A and C is better for these groups than for the dry season pastoral and agro-pastoral groups. Iron levels however are not increased in these cases.

· All groups show deficiencies in vitamin C, apart from the riverine during the wet seasons. Availability of vitamin C and vitamin A is as low as 10% of requirements in some cases. Agro-pastoral diets show particularly low vitamin levels.

· Low iron availability is common to all groups all year with the exception of pastoralists, this group show low iron in the poor wealth group during the dry season. This deficiency is particularly high (50%) for poor riverine households.

· The generally low availability of nutrients means that even in cases where requirements are just met, small changes in purchasing power and productivity will have an impact on consumption pushing nutrient availability below requirements.
· The limited food diversity that provides particular nutrients also means that choices made by individual households can have great effect on nutrient availability. For example, riverine households that do not consume wild leaves will not have sufficient vitamin C.

Study of consumption patterns in other food economy zones would further an understanding of the range of food use in Somalia and its affect on nutrient availability.

Food choice and its impact on nutrient availability would advance understanding of the urban group. A good understanding of realistic options open to the urban poor would aid design of interventions based around education.

Seasonal effects

Pastoral households show the greatest seasonal change in consumption patterns. The urban poor likely have the smallest seasonal change. The reduction of cereal and introduction of larger amounts of milk has positive effects on nutrient availability for the pastoral household although the change may not increase energy levels. Despite some changes in consumption patterns during different seasons, nutrient availability does not show significant change for agro-pastoral households. The riverine group shows limited difference in consumption during wet and dry seasons, although the use of wild leaves during the wet seasons increases vitamin availability.

More detailed information on the effects of consecutive unseasonal consumption patterns (due for example to lack of milk during drought) on quantities of cereals and other goods consumed would further research into possible causes of malnutrition.

Understanding of seasonality (and its relationship to other factors) on the urban poor should be developed.

Wealth status

Deficiencies in nutrient availability are greater for the poor in all food economy groups. Benefits gained during the wet seasons by the pastoral and agro-pastoral groups tend to be slightly smaller for the poor. Micronutrient availability in the riverine groups appears to be least clearly defined by wealth group, largely due to equal availability and use of wild foods. The riverine poor do have greater difficulties meeting basic macronutrient needs than the middle wealth group. The agro-pastoral poor appear to have the lowest overall supply of nutrients.

Intra-household distribution

Children are reportedly given preference over adults particularly during periods of food stress in all food economy groups. No bias between male and female children was found. The methodology employed for this study doesn't allow for actual individual intake to be measured. Children may benefit the most from 'extra' food in food economy groups with the large supplies of milk (agro-pastoral and pastoral). Pregnant women in all groups appear to under-eat. Aside from some evidence within the urban group, no special foods are reserved for pregnant women.

Meal composition, preservation and storage

Preparation of cereals shows strong similarities between the food economy groups. Pastoral households show a preferance for imported rice over local cereals but comment that this preferance is not always met in practice. Riverine and agro-pastoral households have a preference for milled grain although may use less rice than pastoral households. Additions to cereal, aside from milk, may be more common in urban and riverine groups than agro-pastoral and pastoral groups.

As would be expected milk makes up a larger proportion of the total food consumed in pastoral households than was found in other groups. In pastoral households whole meals are made up of milk during the wet seasons. Actual intake of nutrients available in milk is likely to be high, as milk is not cooked.

Percentage energy from milk and milk products and cereals

Food economy group and season	Middle wealth group		Poor wealth group	
	Cereal	Milk	Cereal	Milk
Pastoral				
Dry season	35	30	45	10
Wet season	20	70	35	35
Agro-pastoral				
Dry season	60	10	70	5
Wet season	50	30	70	10
Riverine				
Dry season	50	5	70	0
Wet season	50	10	70	5

Preservation and storage appears limited for all groups but particularly for the urban and riverine groups. Pastoralists are most likely to make ghee, sour milk and dry meat.

It appears that underground storage of grain is in decline in the agro-pastoral and riverine villages visited as past of this study. Further investigation of the wider relevance of this and to declining storage patterns in general is yet to be completed.

Response to food shortage

Poor households in all food economy groups gain only sufficient or less than sufficient nutrients from food consumed in 'normal' conditions. Small changes in circumstances will have an effect on consumption levels. Reduction in food intake can be a regular feature of pastoral, agro-pastoral, riverine and urban groups. This is more common among the poor but not confined to this group. Vegetables, meat and milk are generally reduced before cereal. Sugar is often the last item to be reduced before cereal. Some sugar will be bought if possible even if this means a large reduction in cereal intake.

Perceptions of malnutrition

Perceptions of malnutrition show strong similarities across the food economy groups. It is difficult to know if differences that were apparent can be associated with the food economy group itself or whether they can only be associated with the particular group of persons interviewed. Those interviewed from the pastoral group appeared to understand malnutrition in relation to weak blood or lack of blood in the body and perceived malnutrition in a way more divorced from bio-medical understandings than the other groups.

Indications of change over time

There was an agreement across groups that the past was better in terms of access and availability to food, although the reference point in the past was, in general, unclear. Many informants expressed their experiences of changing foods in terms of the life cycle rather than in terms of change external to it. Pastoral and urban groups appear to have seen the largest change. Diminished purchasing power has generally imposed change in staple or cereal choice rather than decreased diversification.

Likely contribution to malnutrition

All food economy groups show some deficiencies. Poor wealth groups in particular commonly show deficiencies in macronutrients outside of periods of food stress. Limits to the nutrients provided in normal diets together with the regular occurrence reductions in both variety and quantity of foods consumed within the households contribute to the common occurrence of undernutrition and micronutrient deficiencies in Somalia. The clearest point of concern from reported practice of individual consumption patterns is the limited intake of pregnant women.

Information collection on consumption patterns in varied geographical areas of Somalia would give further indications of the differences and particular problems faced

Continued research on the relationship between limited food intake and disease could develop understanding of the extent to which disease makes a contribution.

Implications for the design of interventions

Not all consumption possibilities are exploited (for example wild leaves and fish). Bioavailability of nutrients is avoidably reduced in some cases (for example over cooking of tomatoes). Carefully planned education programmes would be needed to tackle issues regarding the health and nutritional status of pregnant women. However the clearest deficiencies require attention to levels of production and purchasing power. Clear differences exist when comparing the possibilities for interventions with the various food economy groups. The most obvious opportunities exist for agricultural extension activities with the riverine groups. Educational activities are likely to be more practical in the less mobile communities.

Agricultural extension work and programmes involving nutritional education have taken place in Somalia although the transfer of information of the experiences learnt from these programmes has often been weak. A well-circulated comprehensive review of programmes that relate directly or indirectly to nutritional status would aid interested agencies in the planning and design of future activities.

Research for programming for the urban needs to look beyond Somalia (where very limited work has been done in this area) at the growing urban research and interventions elsewhere in Africa.

References

Abdullah M and Wheeler E (1985) 'Seasonal variations and the intra-household distributions of food in a Bangladeshi village' in American Journal of Clinical Nutrition *vol 41 p 1305-1313.*

ACF (2002) 'Nutrition Causal Analysis, Luuq district, Gedo region, Somalia'.

ACF (1998) 'Valeur nutritionnelle des aliments couramment utilisé en Afrique' sources FAO (1968) and Pliatt (1962) in 'Formation Nutrition' unpublished.

AAH (2001a) 'Nutritional Causal Analysis, El Wak, Mandera District Kenya'.

AAH (2001b) 'Nutrition Causal Analysis as part of the inter-agency assessment mission in Mandera district, Kenya'.

Cameron M and Hofvander Y (1983) Manual on Feeding Infants and Young Children *Oxford University Press. New York.*

Dos Santos H and Damon M 1987 'Table de composition des aliments' in Manual de Nutrition Africaine *ACCT, IPD and Editions, Karthala.*

FAO/WHO 2002 'Expert consultation on human vitamin and mineral requirements' phf files from http://www.fao.org/es/ESN/Vitrni/vitrni.html 24.07.02

Ferro-Luzzi A, Morris S, Taffesse S, Demissie T, D'Amato M 2001 'Seasonal Undernutrition in Rural Ethiopia. Magnitude, Correlates and Functional Significance phf files from http://www.ifpri.org/pub/pubs.htm118rreport 16.08.02

Fleuret A (1986) 'Survey of nutrition in east Africa' in Quendt S and Ritenbaugh C (eds) Training Manual in Nutritional Anthropology' *American Anthropological Association. Washington D.C. p 90-97.*

Fleuret A (1988) 'Food Aid and Development in Rural Kenya' in Brokensha D and Little D (eds) Anthropology of Development and Change in East Africa *Westview Press. London and Boulder. p 77-98.*

Food and Agriculture Organisation of the UN (1968) 'Food composition table for use in Africa' http://www.fao.org/DOCREP/003/X6877E/X6877E00.HTM 24.07.02

Haddad L, Peña C, Nishida C, Quisumbing and Slank A (1996) 'Food Security and Nutrition Implications of Intrahousehold Bias: a Review of Literature' Discussion Paper No. 19, Food Consumption and Nutrition Division, International Food Policy Research Institute, pdf file from http://www.ifpri.org/divs/fcnd/dp/dp19.htm 24.07.02

International Medical Corp (1997) 'IMC/UNICEF EPI and Nutrition survey, Belet Weyne Villages, Belet Weyne Distrct, Hiraan'

Leonard W, R (1989) 'Protection of children from seasonal nutritional stress in an Andean agricultural community' in European Journal of Clinical Nutrition *vol 43 p 597-602.*

Miller B 1981 The endangered sex: Neglect of female children in rural North India. *Cornell University Press. New York*

Nantel G 2002 'Human Vitamin and Mineral Requirements' FAO site http://fao.org/es/ESN/Vitrni/vitrni.html 24.07.02

Pratt C 2001 Traditional Early Warning Systems and Coping Strategies for Drought among Pastoral Communities. Northeastern Province Kenya *Tufts University USA and Northern Region Development Agency. Kenya*

Quandt S (1986) 'Nutritional Anthropology: the individual focus' in Quendt S and Ritenbaugh C (eds) Training Manual in Nutritional Anthropology' *American Anthropological Association. Washington D.C. p 3-20.*

Seaman J, Clarke P, Boudreau T, Holt J (2000) The Household Economy Approach. A resource manual for practitioners *Save the Children. London.*

Ulijaszek S, J and Strickland S, S (1993) Nutritional Anthropology. Prospects and Perspectives *Smith-Gordon and Company. London.*

UNICEF 1998. Children and Women in Somalia. A Situation Analysis *UNICEF – Somalia. Nairobi*

UNICEF (1994) consultant's report: 'Report of Infant Feeding Practice in Bay/Bakool'.

UNICEF (1997) consultant's report: 'Consultancy for Nutrition Situation Analysis and Nutrition Programme Planning'.

Van Liere (1994) 'The significance of socio-economic characteristics for adult seasonal body-weight fluctuations: a study in north-western Benin' in British Journal of Nutrition *vol 72 p 479-488.*

Webb P and Harinarayan A (1999) 'A Measure of Uncertainty: the Nature of Vulnerability and Its Relationship to Malnutrition' Disasters *Vol 23 No 4 p 292-305*

Annex One

Guiding questions for use in field study

(1) Daily food consumption

Aim: to understand dietary habits within the household in relation in frequency of meals, timing, combining and preparation. Prioritisation of foods for household members, taboos and any difference in diet for different household members.

- identify the number of adults and children sharing meals
- identify the number of meals consumed during one day
  - is this the same for rich and poor households
  - Is this the same for all family members?
  - If so, why is it different?
- list items consumed in each meal
- Describe the preparation of the meals (any raw items, milling, cooking time, addition of water…)
  - Is this the same for rich and poor households
  - Is this the same for all family members?
  - Do all household members each together, do some eat first, do they share the same plate?
- Are there any foods that a Somali person should not eat?
  - what is the reason?
- Are there any foods that *particular* people should not eat? (men, women, pregnant women, breastfeeding women, boys, girls, ill people)- why is this?
- should pregnant women eat more, less or the same amount of food as other people? Why?
- should women who are breastfeeding eat more, less or the same amount as other people? Why?
- are there any foods that particular people *should* eat or eat more of than other people? (men, women, pregnant women, breastfeeding women, boys, girls, ill people)- why is this?

(2) Seasonality

Aim: to describe seasonality in terms of food access and use
Using food list appropriate to the livelihood group as identified by community, the seasonal calendar is used to identify foods eaten at different times of the year. Cross-check collection and harvest information with consumption patterns to understand storage. Repeat each question for a clarification according to different wealth groups

- identify what foods if any are eaten all year
- identify what foods are eaten during each of the four seasons
- identify what foods are eaten within each of the four seasons
- once the above record is made, identify the quantity of each food as consumed by the household over an average day within the given time period
- for each mentioned food type in each given time period, record whether the foods are purchased, collected, own production (or other household's gifted own production) or stored/preserved own production
- cross-check with (1) for outstanding questions

Aim: to understand any food consumption changes over the life-time of the group members and their households; to document reasons for the changes

Prompts for discussion

- has the food you and your family eat changed over your life?
- if so, in what way has it changed? Types of food, ways the food is prepared, the combinations of foods, proportions of different foods…
- why have their been these changes?

(4) Coping strategies

Aim: to understand response to food shortage

Prompts for discussion

- if a family is not able to produce or purchase enough food, what can they do?
- Are there times when some household members should eat less? Which members are they?
- Is food prepared in a different way?
- Are different foods eaten?
- Which foods are limited first?
- Are less meals eaten or smaller meals? Is this the same for children?

(5) Perceptions of malnutrition

Aim: to understand perceived causes and response

Prompts for discussion

- Do people living here get malnutrition?
- How do you know if someone is suffering from malnutrition?
- What are the reasons for this?
- What can do done about it?
- Are some people more likely to get malnutrition than other people? If so which people and why?
- Do you think malnutrition can be prevented? If so how? Do you face difficulties in preventing it?

Annex three

Calculation of estimated availability of nutrients against recommended intakes.

The study focuses on the allocation of energy, protein, fats, iron, vitamin C and vitamin A to the household through the study of both types and quantity of foods used within the household.

Nutrient values of specific foods were not analysed directly from the purposes of this study. Representative nutrient values of foods were obtained from a collection of composition tables which were used in combination to find representative values of foods appearing on lists made in the field (for tables see Cameron and Hofvandander 1983, FAO 1968, ACF 1998, Dos Santos and Damon 1987).

The household used in the example shown for the estimations of intake of the various nutrients was comprised of one adult male one adult female (lactating) and breastfed infant plus three other children aged 3 years, 5 years and 7 years old. Recommended intakes for the above nutrients for these individuals (see FAO/WHO 2002) were combined to make a total nutrient need for this household's daily intake. This was used to compare with estimated intakes by FEG, wealth group and season. Estimates were based only on recall and agreement with households of different composition was tested through 24 hour recall of those individual households.

Nutrient requirements of different groups of persons vary, they also vary between individuals. Estimated availability does not take this into account. The only calculations that can be made from food tables are values for amounts present in the raw food. They do not give the loss through cooking or amount that will be absorbed and used by the body. Notes on loss during cooking are indicated in the notes on food use in each case study.

There are a number of problems concerning the creation of recommended nutrient intakes. Apart from energy, values for nutrients are set at two standard deviations above the average therefore recommended intakes are based on over-providing for most people to ensure that everyone gets enough. It is unlikely that nutrient requirements will be the same under different circumstances, exposure to measles and malaria raise nutrient requirements. Experimental physiology studies have generally been carried out in developed countries were the population's handling of macronutrients may be less efficient than those in developing countries. This may result in the setting of the lower limits of nutrient requirements at too higher level (Ulijaszek and Strickland 1993:144). There is no clear current understanding of whether recommended nutrient intakes are fully applicable for developing countries "but the time may be coming when RNIs will need to seen differently for developing countries, and based on developing country data. There may be a need to identify some biomarkers that are specific to developing country conditions. There is therefore an urgent need for research to be carried out in developing countries about *their* nutrient needs" (FAO 2002:2).

Example of estimated availability of nutrients for a poor agro-pastoral household during dry seasons

100g	kcal	g/p/d	kcal total	protein (g)	g/p/d	lipides (g)	g/p/d	iron (mg)	mg/p/d	Vit A*	p/d	Vit C (mg)	mg/p/d
goat carcasse	145		0	16	0	9	0	2.5	0		0	0	0
camel meat	72.8		0		0		0		0		0		0
fish	95		0	18	0	0	0	2		18	0	0	0
egg	140			11.8		9.6		2.8		350	0	0	0
											0		
goat milk	82	500	410	3.3	16.5	4.9	24.5	0.1	0.5	40	200	1	5
camel milk ml	70		0	2	0	4.1	0	3.7	0	50.9	0	2.9	0
cow milk	79		0	3.8	0	4.8	0	0.2	0	40	0	1	0
ghee	862		0	0.3	0	97.8	0	0.4	0	420	0	0	0
											0		
sorghum	355	1500	5325	11.5	172.5	3.2	48	3.5	52.5	0	0	0	0
maize	363		0	9.5	0	4.4	0	2.5	0	0	0	0	0
											0		
vegetable oil	884	100	884	0	0	110	110	0	0	0	0	0	0
											0		
cowpeas	368		0	20	0	0.4	0	6.4	0	6	0	0	0
											0		
sugar	400	300	1200	0	0	0	0	0	0	0	0	0	0
wheat flour	346		0	10	0	2	0	1.5	0	0	0	0	0
rice	354		0	8	0	0	0	2	0	0	0	0	0
pasta	353		0	11.5	0	1	0	1.4	0	0	0	0	0
											0		
potato	82		0	2	0	0.1	0	0.8	0	0	0	18	0
leaves	42		0	5	0	0.2	0	4	0	950	0	88	0
onion	41		0	1.5	0	0.1	0	0.5	0	0	0	11	0
tomato	20	100	20	1	1	0.2	0.2	0.7	0.7	80	80	26	26
pepper	42		0	2	0	0.8	0	1	0	460	0	150	0
											0		
citrus	32		0	0.6	0	0.8	0	0.7	0	122	0	48	0
banana	116		0	1	0	0.1	0	0.5	0	30	0	10	0
mango	63		0	0.5	0	0	0	0.5	0	180	0	30	0
watermelon	23		0	0.5	0	0	0	0.3	0		0	5	0
											0		
honey	286		0	0.4	0	0	0	0.4	0	0	0	0	0
total			7839		190		182.7		53.7		280		31
% d/needs			77.88		94.06		65.72		59.01		11.34		14.76

*values expressed as retinol equivalents