



## Cost of Diet assessment

Magaria-Kantché,  
Zinder Region, Niger  
May 2011

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Esther Busquet

# Summary

## Objectives

The objectives for conducting the Cost of Diet survey are:

1. To get a better understanding of the underlying economic causes of malnutrition in the irrigated livelihood zone of Magaria - Kantché
2. To use scenario modelling to assess possible programmes to tackle the identified causes of malnutrition (in order to assist in programme design).
3. Use the results of this CoD assessment for advocacy purposes
4. Capacity building of the food security and nutrition staff in Save the Children Niger

## Methodology

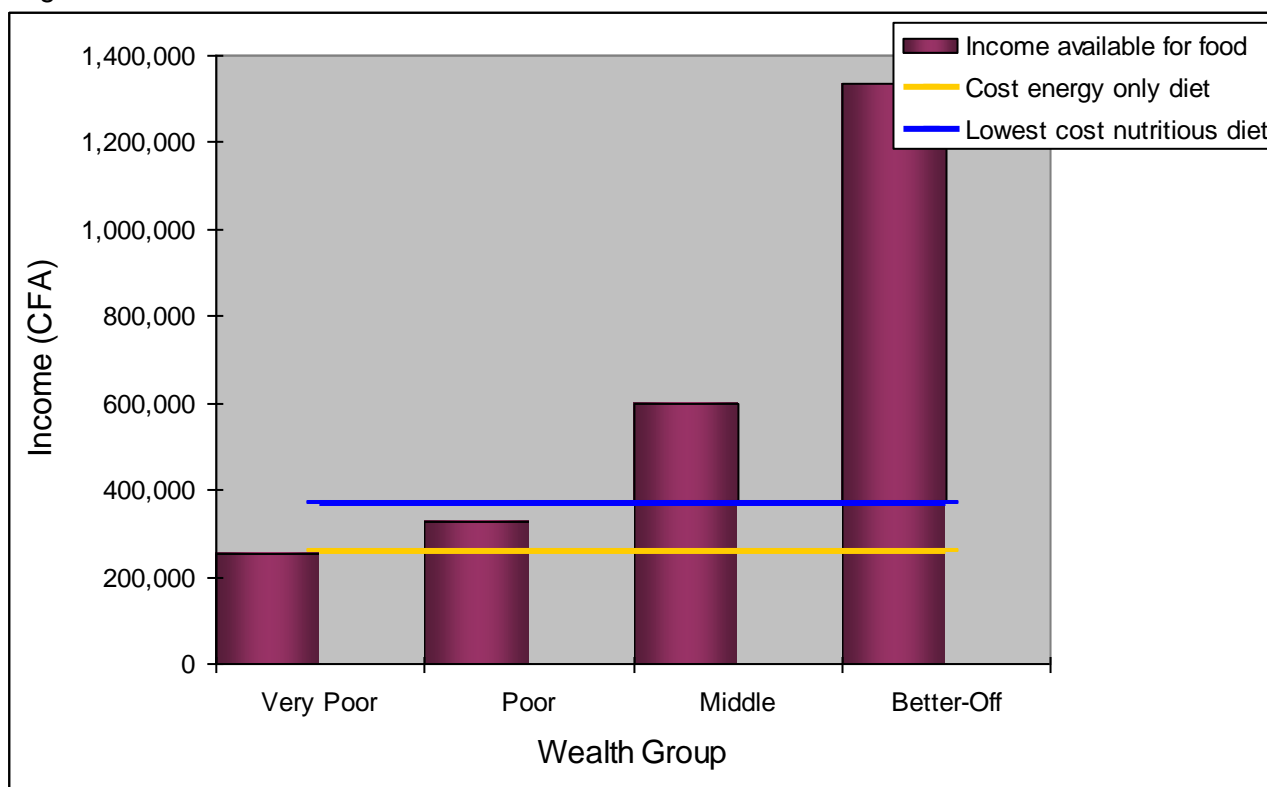
The Cost of the Diet calculates the minimum amount of money a family will have to spend to meet their energy, macro- and micronutrient requirements using locally available foods. Data were collected, on all foods available (for purchase, from own production and collection in the wild), prices of these foods and the actual diet currently eaten by 12-23 month old children. The Cost of Diet software (which is using linear programming) calculates the minimum cost of a diet for the whole family. Possible scenarios were run to look at impact of possible programmes tackling the identified economic barriers to a nutritious diet. This CoD assessment took place in May 2011 in the Magaria-Kantché irrigated zone in the Zinder Region in southern Niger. Data was collected in four markets on food weights and prices and in 8 villages on the actual diet. Data on food consumption frequency was collected among the very poor and better-off wealth groups, for comparison.

## Results

All nutrient requirements can be met with the foods available on the market, which indicates that **availability of nutrient-rich foods is not a main cause of malnutrition** – at least not in May, which is at the end of the intermediate season, when the number of different food items and the amounts of food available are reducing and prices are increasing.

The minimum cost nutritious diet costs 405,022 CFA for the whole family (6 people). This is far more than people from the very poor and poor wealth groups have to spend on food (252,229 CFA and 325,936 CFA respectively). **This means that for 64% of the people in the Magaria-Kantché irrigated zone a nutritious diet is unaffordable in the intermediate season.** The size of the gap between the income available for food and the lowest cost nutritious diet is 152,793 CFA for the very poor and 79,086 CFA for the poor.

**Figure I** – the costs of the lowest cost nutritious diet and cost of an energy-only diet for very poor people, compared to the average annual income available for food for all four wealth groups in Magaria-Kantché



### Recommendations

1. To investigate existing social protection programmes and consider a cash transfer programme
2. To research the livestock value chain to assist in decisions on any possible livestock support programme
3. Nutrition education to improve infant and young child feeding practices (including exclusive breastfeeding for 6 months, continued breastfeeding till 24 months and appropriate complementary foods from 6 months old) and with clear achievable messages are essential
4. To assess existing monitoring systems and to consider setting up a food security and nutrition surveillance system
5. To continue collaboration with government and other organisations and assure policies are in place and implemented
6. To repeat the Cost of Diet assessment in the other seasons, as availability and affordability are expected to be less than in the harvest season

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# 1. Introduction

## 1.1 Background

Save the Children (UK) is present in the Zinder region since the food and nutrition crisis of 2005 and implements a comprehensive programme focused on achieving children's rights, through improving the promotion of maternal and child's health, including food security and livelihoods programmes.

Every year, more than 40,000 children are admitted in Save the Children supported malnutrition treatment centres, which makes Save the Children a major player in the fight against malnutrition in Niger, and particularly in the Zinder region. In this region, Save the Children works in the district of Magaria-Kantché where child malnutrition rates are the highest within the Zinder region.

To better understand the underlying causes of malnutrition, a Household Economic Approach (HEA) was conducted in December 2009 by Save the Children in the irrigated livelihood zone of Magaria-Kantché district. This study showed that the poorest households often cannot meet their basic food needs (defined as energy needs of 2100 kcal per person per day) during the lean season.

The study into the causes of malnutrition carried out by Save the Children in 2007 in the northern area of Tessaoua District (bordering with the Zinder region) revealed that 85% of the households with children admitted into the nutrition rehabilitation centres were from the poor and very poor wealth groups.

Despite the fact that the districts of Magaria and Kantché are an excellent agricultural production area in the region, the HEA showed that household income largely comes from livestock.

To improve the income of poor households and to facilitate children's access to a diet sufficient in quantity and sufficiently diversified, Save the children has implemented an extensive programme of animal distribution to the poor and very poor after the food crisis in 2010 in the Magaria district. Wherever gardening is possible in these districts, Save the Children supports rural producers by constructing wells, boreholes, irrigation canals and power pumps, providing quality seeds and enhancing their capacity through various trainings on new cultivation techniques.

In order to better understand the causes of child malnutrition and to identify new avenues of projects most beneficial to children from vulnerable groups in the Zinder region, Save the Children conducted a study on the cost of the diet in the districts of the irrigated zone in Magaria and Kantché in May 2011.

## 1.2 Objectives of the Cost of Diet survey

The objectives for conducting the Cost of Diet surveys are:

1. To get a better understanding of the underlying economic causes of malnutrition in the irrigated livelihood zone of Magaria-Kantché
2. To use scenario modelling to assess possible programmes to tackle the identified causes of malnutrition (in order to assist in programme design).
3. Use the results of this CoD assessment for advocacy purposes
4. Capacity building of the food security and nutrition staff in Save the Children Niger

## 2. Methodology

The CoD software uses linear programming to identify the gap between income or food expenditure and the lowest cost of a diet that meets all the energy and nutrient requirements of a household and/or of an individual within the household. It builds strongly on the findings of the Household Economic Approach (HEA) that was carried out in the area in 2009 [HEA, 2009].

The following information is collected during the CoD assessment:

- A list of all locally available foods
- Market data (price per 100g of each food item)
- Food consumption pattern data
- Information on the location, seasonality, household composition, wealth groups and income

The CoD software uses the collected information to determine if a nutritious diet can be achieved using locally available foods, and if people can afford this nutritious diet, by comparing costs to income data collected during the HEA assessment in order to better understand and make estimations regarding the capacity of a household to afford a sufficiently nutritious diet.

After determining the lowest cost nutritious diet, the software is used to model the impact of different scenarios (such as including nutrient-rich foods, adding a cash transfer to available income, or changing the number of times certain foods are consumed), in order to inform programme design.

### 2.1 Development of the Food List and units

One of the most important steps in the CoD assessments is the development of the Food List. This is a list of all locally available foods: foods available in the markets, especially those visited by the poorest households; foods grown and wild foods collected. This food list was as complete as possible, and included all foods available throughout the year. During the pilot and in the feedback session afterwards, this exhaustive food list was reduced for use during the assessment: any foods that were considered unavailable in the area during the current season or 'complex' prepared meals sold on the market (without known recipe and thus without exactly known food composition), as well as foods of which the food composition was unknown (as they were not included in the software's food composition table) were excluded from the list. Any foods identified later on (during interviews) were added to the list, together with price and weight data. If the composition of the food was known (e.g. the food was included in the software's food composition table) the food was included in the final food list which was entered into the CoD database.

The final Food List, as entered in the database is shown in Annex I.

For some food items the food composition was unknown, but alternatives could be used:

- Dried cabbage and dried sweet pepper were entered as fresh cabbage and fresh sweet pepper as the composition of the dried vegetables was unknown
- Guinea fowl's eggs were included as large chicken eggs

### 2.2 Data collection and consolidation

The following data was collected for the analysis:

1. Market data
  - The weight of a food item as it is sold
  - The price of a food item as it is sold
2. Food consumption data

- 24-hour recalls from 12-23 month old children

### **Market survey**

For the market survey traders on the markets were interviewed on the prices of food items as they were sold, and food items were weighed in those same units.

The weight of the local unit of each food item (e.g. tia (bowl), pile) was consolidated, outliers removed and averaged in order to establish a weight in grams per local unit. Then the price per 100g of each food item was calculated in CFA (Nigerian currency) and entered in the CoD software.

### **Food consumption data**

24-hour recalls were collected to get an idea of the actual diet as it is currently eaten among children of the 12 to 23 month old age group. Mothers were interviewed about everything their 12-23 month old child had consumed during the previous 24 hours. The amounts of foods eaten were recorded using household measures, and during data entry these household measures were converted into grams. The estimations made during this conversion are provided in Annex II.

For each wealth groups 30 interviews were conducted; due to time constraints no interviews were conducted for the poor and middle wealth groups.

As it became clear during the training that the patterns for children under two and the rest of the family would be very similar, these interviews also give a fairly accurate idea of what foods the rest of the family consumed during a day (except for the quantities).

For the analysis of the collected data version 5.1 of the CoD software has been used.

## **2.3 Training**

Ten staff members from SCUKNiger's food security and nutrition programmes were selected to take part in the Cost of Diet survey. They received a two-day training from the Cost of Diet specialist in data collection for a Cost of Diet assessment, and one and a half day training in data cleaning, data entry and basic analysis of the data, using the CoD software.

The training conducted included:

- Introduction to CoD
- Identification of villages and markets, household composition and seasonal calendar
- Development of the Food List
- What data to collect and how to fill the forms
- Pilot data collection on a market and in a village
- Cleaning the data and preparing the data for entry into the CoD software
- Basic analysis of the collected data using the CoD software

## **2.4 Additional required data**

As indicated before, the cost of diet analysis is building on the household economic assessment done in the same area just before this CoD assessment. In this paragraph the HEA information used is summarised, but more details are provided in the HEA report [HEA 2009].

### **Period of data collection**

The data for this CoD assessment were collected in May 2011, which is at the end of the intermediate season, between the harvest (or low-price) season and the hunger (or high-price) season.



### Location of the CoD assessments

The sampling for the CoD assessment builds upon the sampling that was done for the HEA assessment in 2009, and takes place in the same livelihood zone. Market data was collected from the markets where the poorest households purchase their food. The livelihood zone is located in the southern part of Zinder Region, in southern Niger (see figure 2.1). More details on the zone can be found in the livelihood zone profiling conducted together with the HEA at the end of 2009 [Profiles 2009].

Location: Zinder Region, Niger  
Livelihood zone: Magaria-Kantché irrigated livelihood zone  
Villages visited: Kaya, Koré Haoussa, N'goual Bako, Dan Barto, Gocholo, Kongonrawa, Ramani Zané, Géré,  
Markets visited: Kaya, Matameye, Mai Wando, Bandé, Gayi

All data was checked for errors at the end of the day, and again during data entry, which was done at the end of the day or as soon as possible after that (due to time constraints there was not always sufficient time at the end of each day).

**Figure 2.1** – Magaria-Kantché (green) irrigated livelihood zone, Zinder Region, Niger



### Wealth groups and household composition

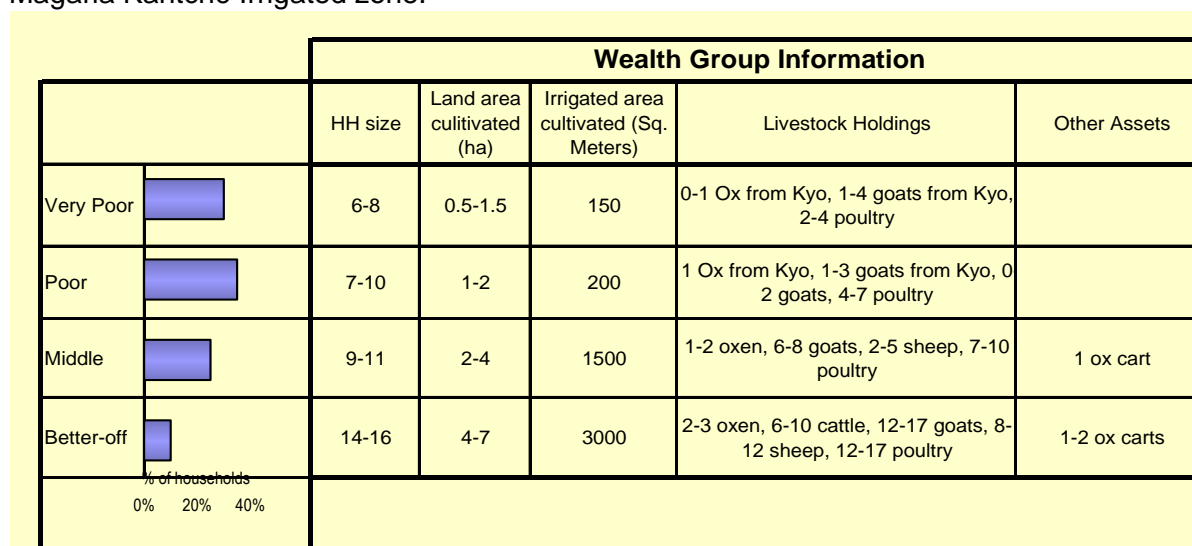
For this Cost of Diet survey, the wealth groups and family size identified in the HEA in 2009 were used (see figure 2.2). During the CoD the training the team decided on an average composition of a very poor family (mainly decision of the different age groups for the children and adults of the family). The results are given in Table 2.1.

**Table 2.1** – ‘Average’ household composition of the very poor as identified in the CoD training

<b>Child 12-23 months old</b>	<b>1</b>
Child 3-4 years old	1
Child 5-6 years old	1
Child 7-8 years old	1
Adult female 18-29 yrs old, moderately active, lactating	1
Adult male 30-59 yrs old, moderately active	1
<b>Total in household</b>	<b>6</b>

**Figure 2.2** – The different wealth groups in each livelihood zone, as identified by the people themselves [Profiles 2009]

Magaria Kantché Irrigated zone:



The percentage of the population falling into each wealth group is slightly different for the two zones as is shown in table 2.2.

**Table 2.2** – Percentage of population per wealth group [HEA 2009]

Magaria-Kantché irrigated zone	
Very Poor	29%
Poor	35%
Middle	25%
Better-Off	11%

### Income data

The income data used as basis was collected during the HEA assessment in 2009 and is for the reference year October 2008 – September 2009.

A series of calculations was done to get an estimate for the total amount of income available to households in 2011, and how much of this would be available to purchase food.

Households not only purchased food, but also produced part of the foods they consumed, and received payment-in-kind and are therefore meeting a certain part of their requirements through food they did not purchase. In order to account for this, the amounts of food produced and

consumed and payment-in-kind were converted into a cash equivalent using the market prices per kg of food, as collected for the CoD assessment. These cash equivalents were added to the figure for household income.

In order to correct the income figures collected during the HEA in 2009, national inflation figures and where possible the prices collected during the CoD were used.

An example of all steps and calculations for the very poor wealth group in Magaria Kantché irrigated zone is provided in Annex III.

As the total income also needs to cover for non-food expenses, less than 100% of the income is available for food. In order to estimate how much would be available for food; the non-food expenses as indicated in the 2009 HEA were adjusted with the help of the national inflation figures, and deducted from the total income to obtain the amount of the income that was available to be spent on foods.

**Table 2.3** – Total annual income and total income spent on food per wealth group

Wealth group	Magaria-Kantché irrigated zone	
	Total annual income (CFA)	Total available for food (CFA)
Very Poor	329,534	252,229 (=77%)
Poor	428,010	325,936 (=76%)
Middle	1,091,715	597,353 (=55%)
Better-Off	2,366,958	1,335,061 (=56%)

### 3. Results

#### 3.1 Analysis of the actual diet

The analysis of the actual diet as eaten by 12-23 month old children of the very poor wealth group at the time of the assessments is based on the 24-hour recalls done in all participating villages, and shown in table 3.1.

**Table 3.1** – Average diet of 12-23 month old children from the very poor wealth group

Food item	Quantity (g/day)
Breast milk	
Millet flour	157.6
Cow pea fritter	85.6
Sweet pepper	9.4
Baobab leaves (dried)	12.3
Curd (from cow milk)	83.2
Peanut oil	2.9
Bouillon cube	0.7
Soumbala (fermented African locust bean paste)	0.6
Salt (iodised)	0.7

**Figure 3.1** – Percentages of nutrient requirements met per nutrient for 12-23 month old children from the very poor wealth group

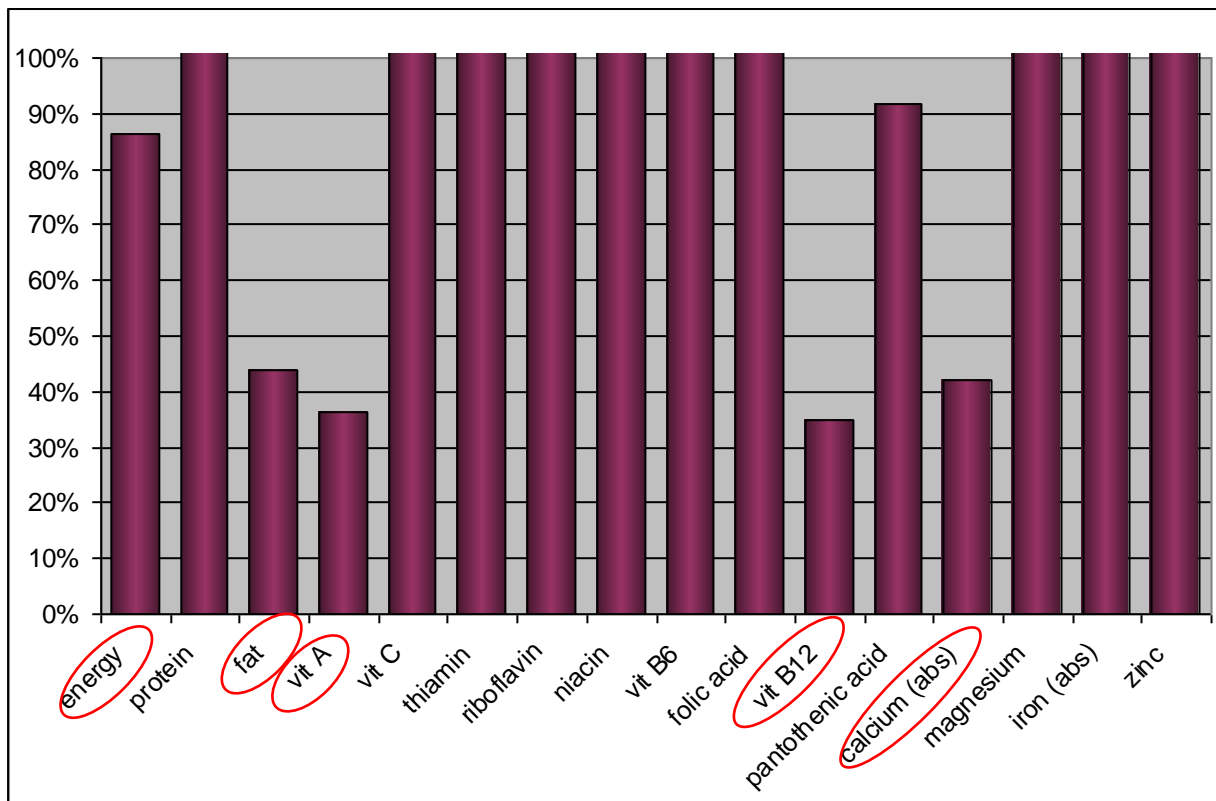


Figure 3.1 shows that the requirements for energy, fat, vitamin A, vitamin B12 and calcium were not met for this age group. The diet of children aged 12 to 23 months as consumed during the time of the assessment does not meet all nutrient requirements, as is shown in figure 3.1 and table 3.1. Energy, fat, vitamin A, vitamin C, riboflavin, vitamin B12, pantothenic acid, and calcium requirements were not met. Especially fat (44%), vitamin A (36%), vitamin B12 (35%) and calcium

(42%) are reason for concern as on average less than half of the recommended daily amount was consumed.

### **The diet of the better-off**

24-hour recalls were also carried out for children aged 12-23 months from the better-off wealth group (as defined by the HEA) in the visited villages, to determine the current consumption habits of this wealth group and differences between this diet and that of the very poor.

The overall quality and quantity of the diet among children in the better-off wealth group is considerably better, as more different types of food are consumed. It is more complex to estimate an average daily diet for children of this wealth group as they have access to more different foods, and thus variety is much larger. Better-off children eat fewer cereal and pulses, but more vegetables, dairy and oil, which increases variety and overall quality eaten per day.

Although most nutrient requirements were met, calcium and vitamin B12 consumption could also be lower than required. Due to the larger variety of choices and the relatively low number of interviews conducted (30), it is more complex to determine an average diet in this group, and thus only an indication of possible deficiency could be provided.

The fact that children from better-off families do meet nearly all nutrient requirements with their diet shows that **behaviour (food consumption habits) is not a main cause of malnutrition in the area**, and that people could meet nutrient requirements if they would have more money available to purchase foods.

### **3.2 Analysis of a possible nutritious diet - availability**

The analysis of the actual diet of very poor children aged 12-23 months has clearly shown that the quality of the diet currently eaten by the very poor is not sufficient to meet all nutrient requirements. Analysis of the collected data shows if all nutrient requirements can be met with the locally available foods. Generic portion sizes were used to assure that foods were only included in this analysis in consumable portions, so the foods included in the lowest cost nutritious diet would not have to be consumed in unfeasible amounts. The software checks if all nutrient requirements can be met, and if this is the case it will show the lowest cost diet meeting all requirements.

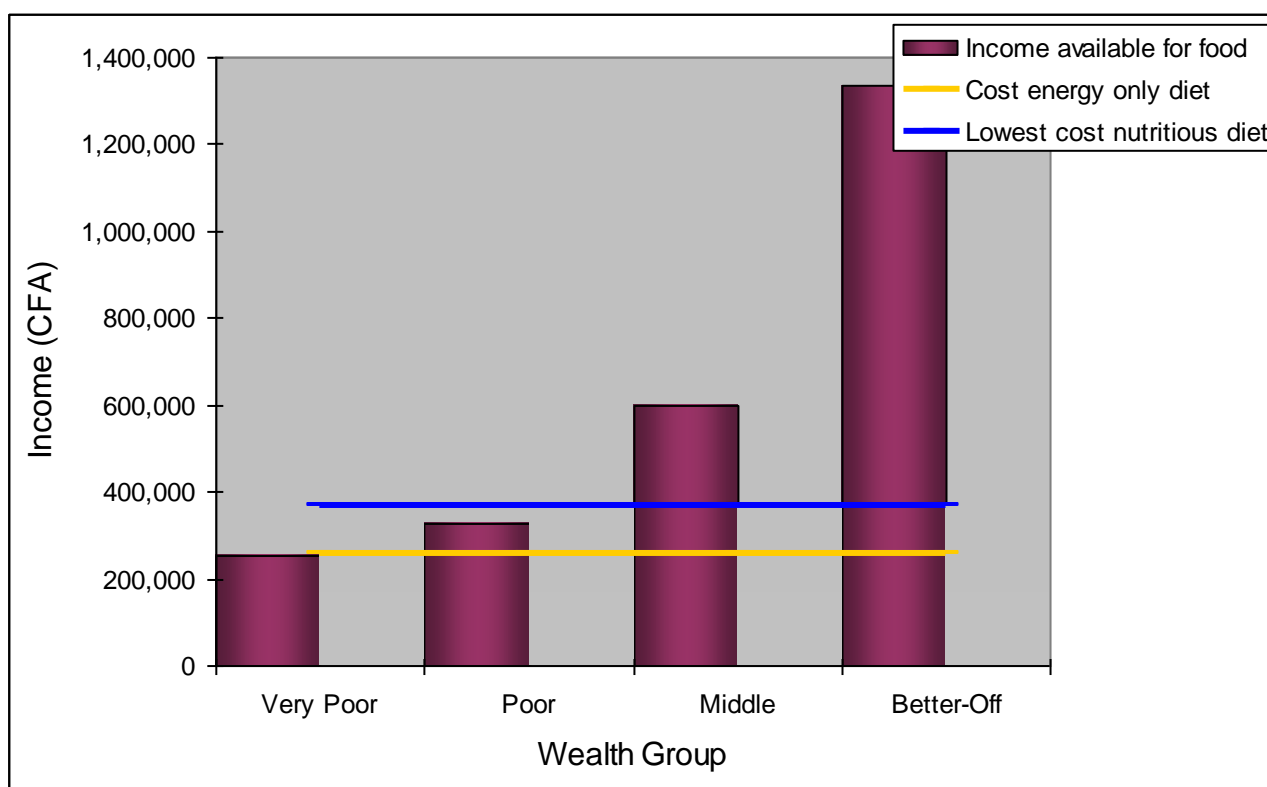
The analysis shows that with the foods available in the area, it is possible to obtain a diet that meets all nutrient requirements for all age groups in the current (intermediate) season.

The fact that all nutrient requirements can be met with the foods available on the market indicates that **availability of nutrient-rich foods is not a main cause of malnutrition** – at least not in May, which is at the end of the intermediate season, when the number of different food items and the amounts of food available are reducing and prices are increasing.

The minimum cost nutritious diet costs 405,022 CFA for the whole family (typically 6 people). This is far more than people from the very poor and poor wealth groups have available to spend on food (252,229 CFA and 325,936 CFA respectively). **This means that for 64% of the people in the area a nutritious diet is unaffordable in the intermediate season.** The size of the gap between the income available for food and the lowest cost nutritious diet is 152,793 CFA for the very poor and 79,086 CFA for the poor.

Figure 3.2 shows the cost of the lowest cost nutritionally adequate diet and an energy-only diet versus the total income available for food for each wealth group and the gap for the very poor and poor. The foods and quantities included in the lowest cost nutritious diet are shown in table 3.2.

**Figure 3.2** – the costs of the lowest cost nutritious diet and cost of an energy-only diet for very poor people, compared to the average annual income available for food for all four wealth groups



**Table 3.2** – Food items selected in the lowest cost diet for children aged 12-23 months and the rest of the family in the intermediate season

Food item	Child aged 12-23 months	Rest of the Family *
Breast milk	532	-
Millet, whole grain	49	491
Soybean	45	332
Ginger root, dried	13	-
Baobab leaves, dried	45	825
Sardines, canned in oil	4	102
Cassava, dried	18	1018
Peanut Oil	-	193

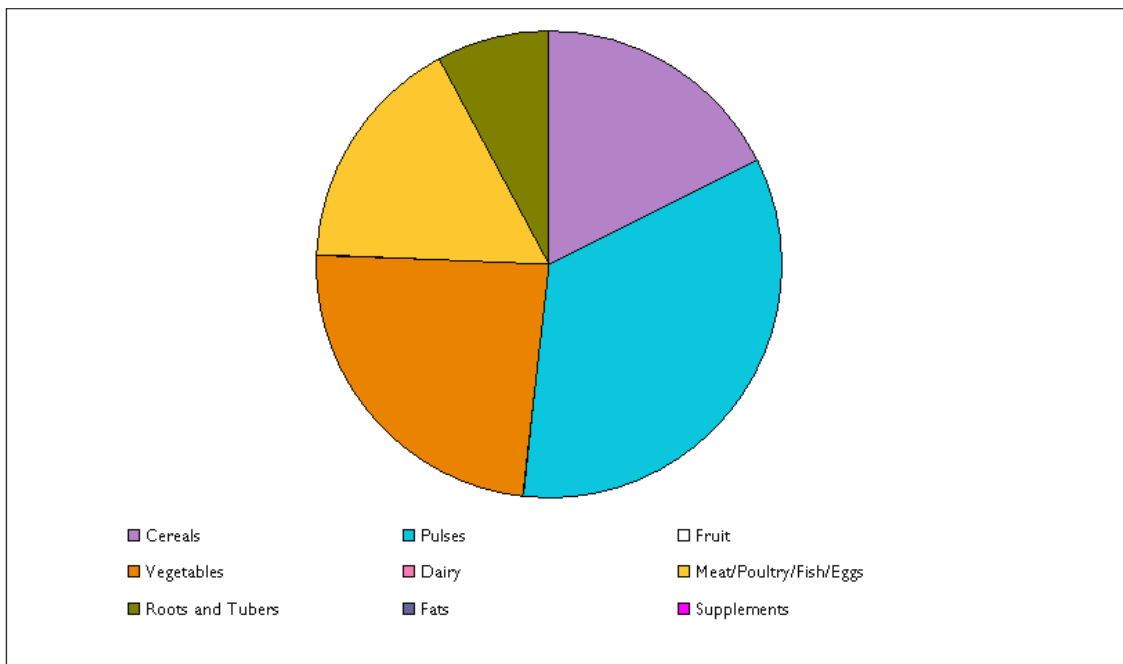
\* NB these are the totals for all family members of 2 years old and above, but requirements per individual in this 'rest of the family' group are different (e.g. a 4-year old has different nutritional requirements than a 35-year old male adult)

This diet is the cheapest diet providing all nutrients in sufficient amounts, but it does not necessarily reflect a culturally acceptable diet. Any modelling of the lowest cost nutritious diet to make it more acceptable/ realistic for a household to consume would increase the cost of the diet. However, all foods included in the lowest cost nutritious diet were consumed by the people from the better-off wealth group, implying that the foods included in the nutritious would all be acceptable for the people in the survey area. A diet was checked that included at least 7 times per week millet and 5 times per week cowpeas (instead of soybeans). The costs of a nutritious diet including millet and cowpeas increased to 418,264 CFA, making this an even more unaffordable diet than the cheapest nutritious diet.

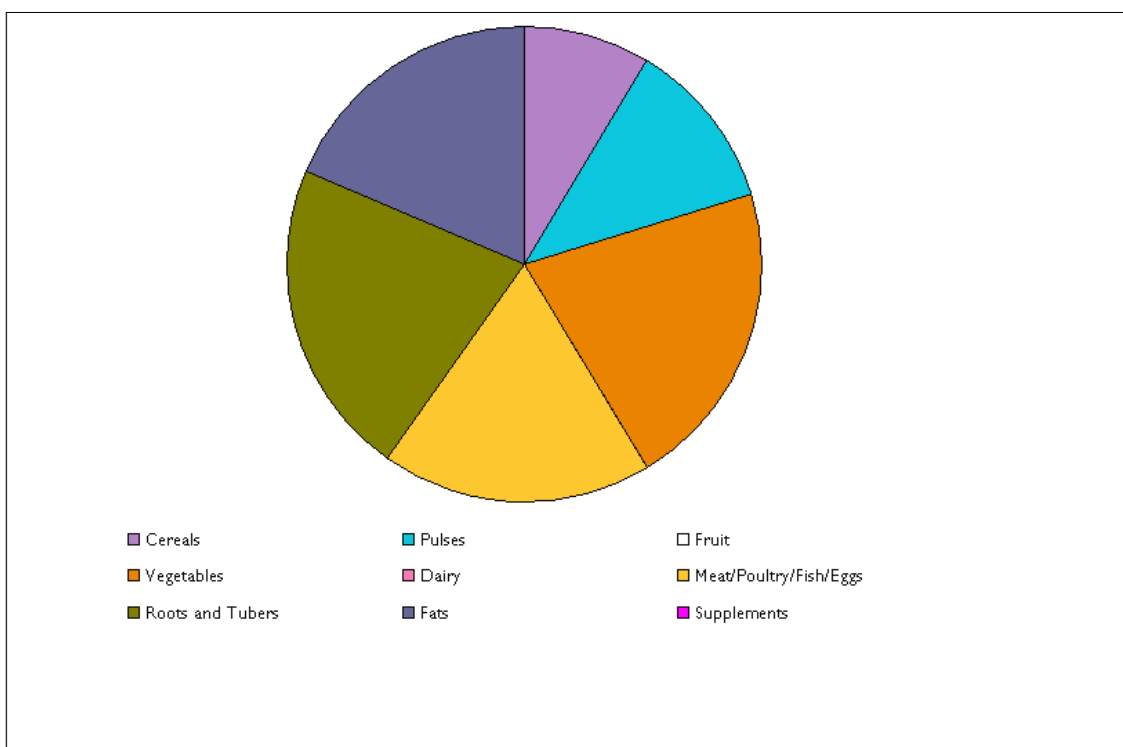
Figures 3.3 and 3.4 show the food groups that contributed to the total costs of the nutritious diet. For 12-23 month old children pulses and vegetables contribute most to the total costs, mainly

because breast milk still makes a large contribution to meeting all nutrient requirements. For the rest of the family roots and tubers, vegetables and fats contribute most to the costs of the diet.

**Figure 3.3** – Contribution of food groups to the minimum cost nutritious diet for children aged 12-23 months



**Figure 3.4** – Contribution of food groups to the minimum cost nutritious diet for the rest of the family



In a Household Economic Assessment (HEA) or in emergency situations not the costs of a nutritious diet, but the costs of meeting the energy requirements ('survival threshold') are considered. The costs of meeting the energy requirements of the 6-person household used as

'standard' in this cost of diet assessment would be 258,957 CFA, which is still slightly higher than the total amount of money available for food in a very poor household. This means that in order to just meet the energy requirements, a very poor household will have to spend more money on food than they have, or decide not to spend money on other essential costs (such as clothes, equipment or education). The cost of the energy-only diet is shown in figure 3.2, together with the minimum cost nutritious diet and the income available for foods per wealth group.

### 3.3 Scenario Modelling

Paragraph 3.1 and 3.2 clearly describe that the current diet of the very poor is not meeting all nutrient requirements, and that this is caused by the too high prices of nutrient-rich foods. In this paragraph several scenarios are described to try to bridge the gap between the money available for foods and the cheapest nutritionally adequate diet.

#### Scenario 1 – Adding a cash transfer to the annual income

In Save the Children programming, a cash transfer is defined as predictable, regular transfers of cash to individuals or households by governments for the purposes of addressing poverty, vulnerability and children's development [SCUK 2009]. Evidence from a wide variety of cash transfer programmes in Latin America and sub-Saharan Africa shows beneficial effects of the programmes on households' access to food. Measured against a range of indicators – including calorie consumption, average numbers of meals and budget expenditure – families use cash to increase their food intake. Crucially for child survival, participants in cash transfer programmes improve the diversity of their diets, increasing their intake of animal protein, fats, fruits and vegetables [SCUK 2009].

For Magaria-Kantché the cheapest diet that meets all nutrient requirements for the whole family would cost 405,022 CFA for the whole year (see paragraph 3.2).

The adjusted data from the 2009 HEA show that a very poor family would spend 252,229 CFA on food, which leaves a gap of 152,793 CFA between a nutritious diet for the whole family throughout the year and the actually earned income available for food for the poorest families. For people from the poor wealth group the gap would be 79,086 CFA.

A cash transfer to cover this gap would be 21,020 CFA per very poor household per month (about £25<sup>1</sup>). Usually the contribution of a cash transfer would be 20-30% of household income, so a monthly contribution of 21,020 CFA falls way beyond this 20-30% range of examples mentioned in the Lasting Benefits report (discussing the role of cash transfers in tackling child mortality) by Save the Children UK [SCUK 2009].

This calculation shows that a very considerable cash transfer would be needed to meet the costs of a nutritious diet, and that other options should be considered. A cash transfer in combination with other options could help the poorest families to obtain a nutritious diet.

#### Scenario 2 – Modelling the effects of a livestock programme

Although the population of Magaria-Kantché are pastoralist, the poorest households do own very little livestock (on average 2-4 hens and possibly 1-4 goats and/or 0-1 cow via *kyo* – HEA 2009) and therefore have limited access to animal products.

Several possible diets were modelled to determine the effect of a livestock programme on the availability and cost of a nutritious diet.

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<sup>1</sup> 1 English pound ~ 800 CFA (<http://www.oanda.com>)



This modelling was based on including the following quantities of animal-source foods in the diet each week:

- Cow products: beef (1-2x/week), intestines (1-2), milk (7)
- Goat products: meat (1-2), intestines (1-2), milk (7)
- Chicken products: meat (1-2), intestines (1-2), broth (1-2), giblets (1-2), eggs (7)
- Cow milk: milk (7)
- Goat milk: milk (7)
- Combinations of the above

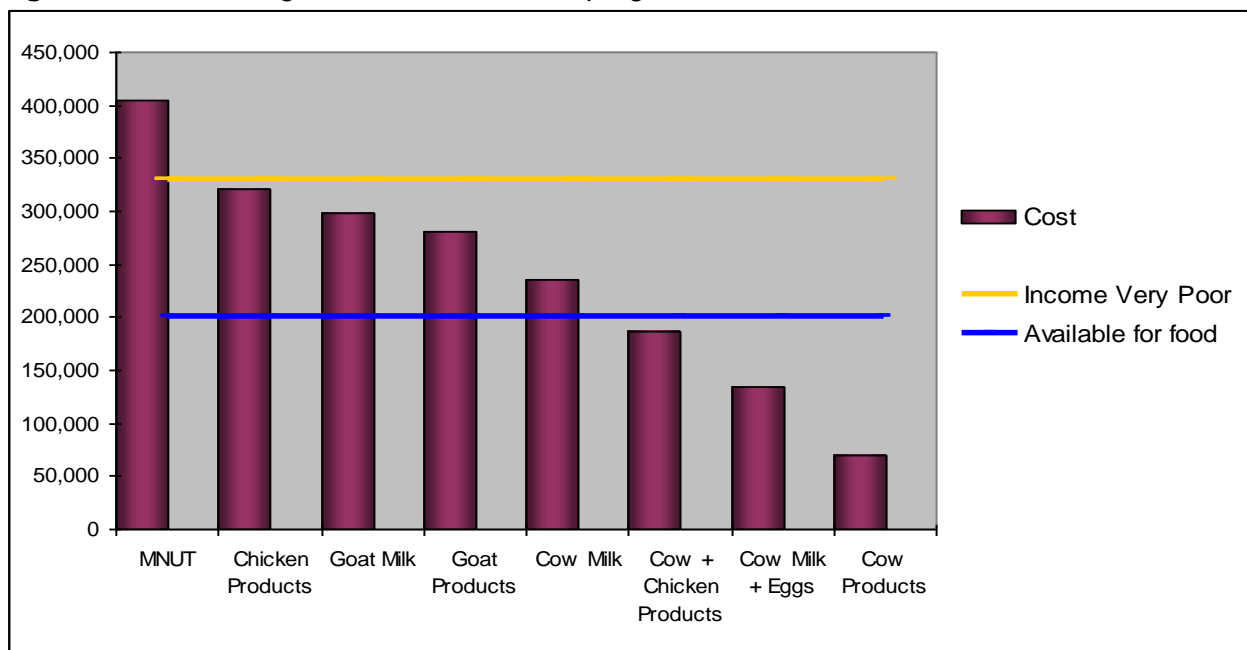
All animal-source foods were included as free.

The inclusion of animal products decreased the cost of the minimum cost nutritious diet as is shown in figure 3.4. Modelling showed that the lowest cost diet is achieved when households have access to cow products or cow’s milk and eggs. As it is unlikely that people would have sufficient numbers of cattle in order to eat cow meat and intestines each week, the option of having access to cow’s milk and eggs is most promising. If a family would have these products free of cost (so from own livestock), the total costs of the nutritious diet would be 134,028 CFA per year, which would be affordable, and cover (part of) the costs associated with livestock upkeep.

The costs of the nutritious diets modelled here do not take into account the additional costs for a household associated with livestock upkeep, including veterinary bills and fodder. The diets presented are based on an idealistic situation whereby households have access to significant quantities of animal-source foods for free. More research is needed on the livestock value chain to see if keeping livestock would be feasible with the current income or not.

Inclusion of chicken or goat products or milk from either cow or goat at the amounts detailed above only slightly improved the quality of the diet, and it would still be unaffordable (still higher than the amount of income available for food).

**Figure 3.4 – Modelling the effect of livestock programmes on the lowest cost nutritious diet**



### Scenario 3 – Adding supplements to the diet

As the current diet for children under two does not meet all nutrient requirements, a multi-micronutrient supplement was added to the diet to see if this would improve the diet and reduce the costs.

The composition of the added multi-micronutrient powder is shown below, (table 3.3.)

Upon the addition of a multi-micronutrient powder to the diet of the children aged 12 to 24 months, the quality of their diet improved and the total cost of a nutritious diet reduced only very slightly to 397,825CFA (1.8%). This reduction is so small that it would not contribute to making a nutritious diet more affordable for the very poor.

**Table 3.3** – Composition of the multi-micronutrient powder included in the diet for children under two

<b>Nutrient</b>	<b>Content/100g</b>	<b>Nutrient</b>	<b>Content/100g</b>
Thiamine	50.0 mg	Zinc	500 mg
Riboflavin	50.0 mg	Iron (absorbed)	106.3 mg
Niacin	60.0 mg	Vitamin A (retinol)	15000 µg
Vitamin B6	50.0 mg	Vitamin C	3000 mg
Vitamin B12	90.0 µg	Folic acid	16000 µg

#### **Scenario 4 – The effect of non-optimum breastfeeding on the cost of a nutritious diet**

As it known that infant and young child feeding practices in the area are not optimal, the effect of non-optimum breast milk consumption was modelled to check the effects on the annual cost of a nutritious diet.

It was assumed that a child got only get half of the recommended daily amount of breast milk, and would have to get the rest of the required nutrients via food intake. Even when a 12-23 month old child would only receive half of the recommended amount of breast milk, a nutritious diet is possible. Costs would go up from 58.92 CFA per child per day to 85.93 CFA per child per day. This means that the total annual costs for a nutritious diet for the whole household would go up to 414,881 CFA, which means a nutritious diet would be more unaffordable than with optimal feeding practices.

A diet which would include millet, as is common in the area would be less nutritious, and thus more other items would need to be included to meet all nutrient requirements, and the price would increase even more.

**Table 3.1** – Average diet of 12-23 month old children from the very poor wealth group

<b>Food item</b>	<b>Quantity (g/day)</b>
Breast milk	266
Cowpea, whole dried	2
Sesame seed	4
Soybean	45
Ginger root, dried	15
Baobab leaves, dried	45
Sardines, canned in oil	7
Cassava flour	29
Cassava, dried	75
Palm oil	4

## 4. Discussion

### Actual Diet

The actual diet of children aged 12 to 23 months as consumed during the time of the assessment did not meet all nutrient requirements. Especially fat (44%), vitamin A (36%), vitamin B12 (35%) and calcium (42%) are reason for concern as on average less than half of the recommended daily amount was consumed.

The fact that with the current diet energy requirements are not met could contribute to the acute malnutrition rate in the area (A SMART survey in Matameye, a district in Kantché in July 2010 by Save the Children showed a GAM of 21.4% and SAM of 5.3%). Vitamin A deficiency leads to night blindness and eventually total blindness, and also has an impact on the immune system of the child, making it more prone to other diseases. Calcium is essential during growth for the bones, and a deficiency can lead to bone weakness (rickets; osteoporosis; osteomalacia). Vitamin B12 intake is related to dietary protein intake, and deficiency can cause pernicious anaemia later in life.

The fact that children from better-off families do meet nearly all nutrient requirements with their diet shows that **behaviour (food consumption habits) is not a main cause of malnutrition in the area**, and that people could meet nutrient requirements if they would have more money available to purchase foods

The actual diet presented here is based on 24-hour recalls conducted for the 12-23 month old child within the household. The caretaker (usually the mother) was interviewed and asked to describe everything the child had eaten in the previous 24 hours, as detailed as possible. The interviewers assured that all eating moments were indicated and all foods mentioned as detailed as possible. Quantities were estimated using household measures, and later converted into grams. However, this conversion was not based on actually measuring the quantities, but estimation.

### Minimum cost nutritious diet

The fact that all nutrient requirements can be met with the foods available on the market indicates that **availability of nutrient-rich foods is not a main cause of malnutrition** – at least not in May, which is at the end of the intermediate season, when the number of different food items and the amounts of food available are reducing and prices are increasing.

The minimum cost nutritious diet costs 405,022 CFA for the whole family (6 people). This is far more than people from the very poor and poor wealth groups have to spend on food (252,229 CFA and 325,936 CFA respectively). **This means that for 64% of the people in the Magaria-Kantché irrigated zone a nutritious diet is unaffordable in the intermediate season.** The size of the gap between the income available for food and the lowest cost nutritious diet is 152,793 CFA for the very poor and 79,086 CFA for the poor.

The annual cost of a nutritious diet was calculated from the price of food items in May 2011, assuming that food prices remain stable across all seasons which is unlikely. As data was collected during the intermediate season, the cost of the diet would increase if data were to be collected during the high-price season and decrease in the harvest or low-price season.

As it is known that prices will go up and availability of foods will go down during the following season (the harvest/hunger season), it is likely that during this season even more households will be unable to afford a nutritious diet, or even the energy-only diet than in the intermediate season. For those unable to afford a nutritious diet in the intermediate season the situation will probably be more difficult and the diet probably even less nutritious, leading to a possible increase in children suffering from acute malnutrition or micronutrient deficiencies.

To calculate the 'real' annual cost of a nutritious diet, it would be best to have data from all seasons, so variations in price as well as availability could be taken into account. This information can be collected by returning each season to collect data.

It should be noted that there was a cheaper diet identified by the CoD software, but this diet included large amounts of African locust bean. Although African locust bean is considered a free wild food (it is collected in the wild as a free addition to the diet), the amounts available in the area are not large enough to provide the amounts included in this diet, and is thus not considered a possible diet for all people in the area, and not presented as the lowest cost diet here. The costs of this diet were 369,333CFA, which is considerably lower than the presented diet.

## Scenarios

Affordability of nutritious foods is a major barrier to achieve a nutritious diet in Magaria-Kantché. Although a cash transfer would be able to help in bridging the gap between the actual income that is available for food and the budget needed to have a nutritious diet for the whole family. However, the amount of money needed to bridge this gap is 152,793 CFA per year for a very poor family, and 79,086 CFA for a poor family, which is more than a usual cash transfer would contribute (20-30% of a household's annual income). Next to that, the design of a cash transfer programme needs to take into account several other factors, such as the fact that people might not spend all money received on food. Thus, a cash transfer could help in bridging the gap, but as a stand-alone programme it would not be sufficient.

Having access to animal-source food items would improve the current diet of the very poor, and if they would have access to these foods at no cost, the lowest cost nutritious diet would be considerably cheaper. Having access to cow products (meat, intestines and milk) would give the lowest cost nutritious diet. However, it is not likely that people will have sufficient numbers of cattle to be able to eat meat every week, as was modelled here. Including regular cow milk and chicken eggs to the diet was the second best option, and would reduce the cost of a nutritious diet to 134,028 CFA, which would be affordable for all wealth groups. However, at the moment the very poor and poor on average do not have sufficient animals to get the quantities of animal-source food items needed to improve the diet sufficiently, as very poor families on average own 2-4 chicken and possibly 1-4 goats and/or 0-1 cows via *kyo*. These animals would not produce sufficient quantities of eggs, milk and/or meat to provide a nutritious diet for the whole family throughout the year.

Addition of a multi-micronutrient supplement does improve the diet of children under two (the normal target group for these supplements), but adding these supplement to the lowest cost nutritious diet only showed a very small reduction of the total annual costs of food for the family. This shows that distribution of these supplements should only be considered as a component of a more comprehensive package to tackle the causes of malnutrition.

Even when a 12-23 month old child would only receive half of the recommended amount of breast milk, a nutritious diet is possible. Costs would go up from 58.92CFA per child per day to 85.93CFA per child per day. This means that the total annual costs for a nutritious diet for the whole household would go up to 414,881CFA, which means a nutritious diet would be more unaffordable than with optimal feeding practices.

## 5. Recommendations

In order to tackle malnutrition in Zinder, in southern Niger, it is essential to design a comprehensive package to treat those children already suffering (and dying) from severe acute malnutrition, and to tackle its causes.

The following recommendations should be taken into consideration when designing this comprehensive package:

1. To investigate existing social protection programmes and consider a cash transfer programme
2. To research the livestock value chain to assist in decisions on any possible livestock support programme
3. Nutrition education to improve infant and young child feeding practices (including exclusive breastfeeding for 6 months, continued breastfeeding till 24 months and appropriate complementary foods from 6 months old) and with clear achievable messages are essential
4. To assess existing monitoring systems and to consider setting up a food security and nutrition surveillance system
5. To continue collaboration with government and other organisations and assure policies are in place and implemented
6. To repeat the Cost of Diet assessment in the other seasons, as availability and affordability are expected to be less than in the harvest season

### 1. Social protection programmes

One of the main recommendations is to investigate what social protection programmes are already existing in Niger and if policies are in place. It is very important to know what programmes exist, whom they are targeting, and if there are any gaps in these programmes that need to be addressed. Proper targeting is essential to make sure a programme contributes to an improvement of the nutritional situation. Due to the size of the gap between the income available for foods and the costs of a nutritious diet, setting up a cash transfer programme alone is not sufficient to bridge the gap.

### 2. Livestock support

Animal-source foods such as cow's milk and chicken eggs would improve the diet of very poor households and considerably reduce the costs of a nutritious diet if these foods would come free (so from owned animals instead of being purchased). At the moment very poor and poor households do not have sufficient access to these foods, as they only own a few animals (2-4 hens, and some sheep/goat or a cow 'on loan' from a better-off family (*kyo*)).

More research is needed on the livestock value chain to see if increasing the number of livestock owned would be feasible and affordable for the poorest families.

### 3. Programmes to improve IYCF practices

Breastfeeding and complementary feeding practices are poor in the surveyed area and seen as immediate reasons for high acute malnutrition. A multi-lateral approach for improvement of Infant and Young Child Feeding (IYCF) practices is recommended involving governmental health institutions, religious leaders and the community. IYCF needs to be put high up on the agenda for addressing acute malnutrition:

- Integrate IYCF interventions into CMAM in the currently served and future health facilities
- Facilitate trainings on IYCF for health staff at hospital and health centre level
- Communicate IYCF messages in communities, include men
- Sensitise mullahs for support of optimal IYCF practises
- Establish women support groups for IYCF
- Establish a network of peer councillors for breast feeding

- Design and run a media/communication campaign for IYCF awareness

#### **4. Monitoring systems**

A system to monitor the nutrition situation in the area is necessary to assure any deterioration is noticed immediately and appropriate action can follow swiftly. This system should also be able to monitor the impact of a new food price crisis on the affordability of a nutritious diet.

It is recommended to study what monitoring systems already exist in Niger, and to study if these data provide useful information to monitor the food security and nutrition situation adequately. If there is no monitoring system, setting up a surveillance system should be considered.

#### **5. Collaboration with government and other organisations**

The comprehensive package of interventions needed to address the complex causes underlying household food insecurity and malnutrition should be led and supported by adequate institutional arrangements, enhancing actions across ministers and sectors.

Collaboration between all stakeholders in food security and nutrition is essential to achieve the required improvements for poor and very poor households and to significantly reduce the high rates of both acute and chronic malnutrition.

Next to collaboration at all levels, policies need to be in place and implemented both at national and state level on:

- Social protection
- Food security and nutrition
- Agriculture (especially nutrition-friendly agriculture and a pro-poor focus)
- Health care (such as free health care for mothers and children)

#### **6. Cost of Diet assessment in all three seasons**

The data collected were for the intermediate season, but does not take into account that food availability and food prices vary strongly between the seasons. It is recommended to repeat the Cost of Diet in all three seasons, especially in the hunger season (the high-price season, from June till August), as it is known that far fewer food items will be available and for much higher prices than in the intermediate season in which this data collection took place.

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## Abbreviations

CFA	West-African CFA franc; currency in Niger
CMAM	community-based management of acute malnutrition
CoD	Cost of Diet
GAM	global acute malnutrition
HEA	Household Economy Approach
IYCF	infant and young child feeding
SAM	severe acute malnutrition
SCUK	Save the Children UK

## Annexes

### Annex I – Food List as used for this CoD with units sold

CoD SOFTWARE DATABASE	List in French	Price/100g/product
	<b>CEREALES</b>	
MILLET, WHOLE GRAIN (SENEGAL)	Graines de mil	18.17
MILLET, FLOUR (SENEGAL)	Boule de mil (bouillir dans l'eau)	40.00
MILLET, FRITTER (SENEGAL)	Mil fritté (galettes)	41.38
SORGHUM, WHOLE GRAIN (SENEGAL)	Graines de sorgho blancs	18.62
SORGHUM, WHOLE GRAIN, RED (SENEGAL)	Graines de sorgho rouges	16.85
MAIZE, YELLOW, DRIED (EGYPT)	Mais sec jaune	21.14
MAIZE, WHITE, DRIED (EGYPT)	Mais sec blanc	19.63
RICE, WHITE, MILLED (INDONESIA)	Riz importé, blanc,	56.07
WHEAT, FLOUR, 72% EXTRACTION (SENEGAL)	Farine de blé	40.86
WHEAT, DOUGH, DEEP FRIED (KENYA)	Chinchin	95.83
SWEET BREAD (BASBOUSA) (EGYPT)	Pain blanc locale (sucrée)	84.03
WHEAT, FRITTER, SWEET (SENEGAL)	Galettes de blé	79.66
BREAD, WHITE (INDIA)	Pain locale (type baguette douce)	73.71
BISCUIT (SENEGAL)	Biscuit	120.56
MACARONI (EGYPT)	Spaghetti local	62.50
MACARONI (SENEGAL)	Macaroni, spaghetti	66.69
	<b>LEGUMINEUSES, NOIX</b>	
COWPEA, WHOLE DRIED (SENEGAL)	Niébé sec	19.47
COWPEA, FRITTER (SENEGAL)	Niébé fritté	34.83
COWPEA, COOKED (KENYA)	Boulette de niébé cuit (avec l'eau)	31.94
SESAME SEED (EGYPT)	Sésame	55.33
SOYBEAN, RAW (KENYA)	Soja sec	37.64
PEANUT, FRESH-EP (SENEGAL)	Arachide décortique	78.31
PEANUT, DRIED, SHELLED (SENEGAL)	Arachide non-décortique	35.45
PEANUT, ROASTED IN SHELL (SENEGAL)	Arachide grillé	83.88
BAMBARA GROUNDNUT FRESH	Voandzu grillé	97.56
PEANUT, POWDER (SENEGAL)	Farine de tourteaux d'arachide	52.53
COLANUT, FRESH-EP (SENEGAL)	Noix de cola	256.91
PALM, NUT (SENEGAL)	Noix de palme	26.67
	<b>FRUITS</b>	
LIME (EGYPT)	Citron vert	65.82
LEMON, SWEET (EGYPT)	Citron jaune	46.30
ORANGE (EGYPT)	Orange	33.55
DATE, BLACK (EGYPT)	Dates frais	50.13
DATE, BLACK, DRIED (EGYPT)	Dates séchées	102.47
MANGO (EGYPT)	Mangue mure	12.47
MANGO, GREEN (SENEGAL)	Mangue verte	6.22
BANANA (EGYPT)	Banane	31.40
PAPAYA, RIPE (KENYA)	Papaye	26.34



GUAVA, FRESH (SENEGAL)	Goyave	40.00
PINEAPPLE (EGYPT)	Ananas	64.79
CANTALOUPE (EGYPT)	Melon	13.22
COCONUT, MEAT (INDONESIA)	Noix de coco	118.57
AFRICAN LOCUST BEAN PULP, FRESH (SENEGAL)	Fruit de néré	0.00
AFRICAN LOCUST BEAN PULP, DRIED (SENEGAL)	Farine de fruit de néré	20.90
TAMARIND, FRUIT, FRESH (SENEGAL)	Tamarin	27.22
	<b>LEGUMES</b>	
TOMATO, RIPE, FRESH (SENEGAL)	Tomate fraîche	17.90
TOMATO, POWDERED (SENEGAL)	Tomate séchée	118.31
ONION, FRESH (SENEGAL)	Oignon	26.89
PEPPER, SWEET, FRESH (SENEGAL)	Poivron sec	228.39
OKRA, DRIED (SENEGAL)	Gombo sec	141.83
GINGER ROOT, DRIED (SENEGAL)	Gingembre sec	71.14
CABBAGE, FRESH-EP (SENEGAL)	Chou séché	151.33
GARLIC (EGYPT)	Ail	153.97
SQUASH, SUMMER, FRESH-AP (SENEGAL)	Courge	9.01
PEPPER, RED OR HOT, DRIED (SENEGAL)	Piment séchée	222.47
CHILI, GREEN (KENYA)	Piment verte	73.62
LEAF, HIBISCUS (INDIA)	Hibiscus frais	8.85
MALLOW (EGYPT)	Malohia séchée	21.19
BAOBAB LEAF, POWDERED (SENEGAL)	Feuille de baobab sec	26.61
LETTUCE (EGYPT)	Laitue	23.44
EGGPLANT, FRESH-AP (SENEGAL)	Aubergine	8.91
	<b>PRODUITS LAITIERS</b>	
MILK, COW, CURDS (SENEGAL)	Lait de vache caillé	52.25
MILK, COW, POWDERED, WHOLE (SENEGAL)	Lait en poudre	324.59
	<b>VIANDE, VOLAILLE, POISSON, OEUFS</b>	
BEEF, W/BONE (SENEGAL)	Viande de vache (avec os)	86.84
BEEF, INTESTINES or GOAT INTESTINES	Viscères de vache, mouton, chèvre	152.80
BEEF, MEDIUM FAT, COOKED (KENYA)	Viande de vache brochette	285.71
CHICKEN (EGYPT)	Poulet	125.91
CHICKEN, COOKED (KENYA)	Poulet grillé	286.84
GUINEA FOWL, FRESH MEAT (SENEGAL)	Pintade	148.38
SHEEP, RAW-AP (SENEGAL)	Viande de mouton	168.92
MUTTON, COOKED (KENYA)	Viande de mouton brochette	329.67
GOAT, FRESH, W/BONE (SENEGAL)	Viande de chèvre (avec os)	189.03
GOAT, COOKED (KENYA)	Viande de chèvre (grillé ou brochette)	458.45
LAMB, HEAD MEAT (EGYPT)	Tête de chèvre	80.75
PIGEON (EGYPT)	Pigeon	110.89
EGG, CHICKEN, WHOLE, LOCAL (EGYPT)	Oeufs de poulet	177.63
EGG, WHOLE, IMPORTED (EGYPT)	Oeufs de pintade	69.44
FISH, CARP RAW-AP (SENEGAL)	Poisson de mer	164.96
FISH, SMALL, FRESH, FRESH WATER (MEXICO)	Poisson de l'eau douce frais	87.06
FISH, SMOKED, DRIED-AP (SENEGAL)	Poisson de l'eau douce fumée	163.40
FISH, SARDINES, CANNED IN OIL (INDONESIA)	Sardines	190.55
	<b>TUBERCULES ET RACINES</b>	
CASSAVA, DRIED, FLOUR (INDONESIA)	Farine de manioc	32.80
CASSAVA, ROOT, FRESH-AP (SENEGAL)	Manioc	23.32
CASSAVA, COOKED (KENYA)	Manioc cuit (avec l'eau)	31.86
CASSAVA, DRIED (INDONESIA)	Manioc sec, cassé	22.43
SWEET POTATO, FRESH-AP (SENEGAL)	Patate douce	26.48

SWEET POTATO, COOKED (KENYA)	Patate douce cuit avec eau	16.22
YAM, RAW (INDONESIA)	Igname	49.23
YAM, COOKED (KENYA)	Igname cuit	54.35
	<b>HUILES, LIPIDES</b>	
PEANUT OIL, LOCAL (SENEGAL)	Huile d'arachide	100.99
PALM OIL, LOCAL (SENEGAL)	Huile de palme	100.99
BUTTER, COW, UNCOOKED (SENEGAL)	Beurre, vache	340.91
	<b>AUTRES</b>	
SALT, IODIZED (KENYA)	Sel iodé	19.59
SUGAR, REFINED (MEXICO)	Sucre blanc	69.78
GREEN CHINESE TEA (SENEGAL)	Thé vert de Chine	456.10
AFRICAN LOCUST BEAN, FERMENTED, DRIED	Soumbala (pâte pour le sauce)	153.82
BOUILLON CUBE (SENEGAL)	Arome	305.85
HONEY (EGYPT)	Miel	184.45
SWEETS (INDIA)	Bonbons	135.31
CHEWING GUM (KENYA)	Chewing gum	157.04

## Annex II – Generic portion sizes for 12-23 month old children

Source: unpublished data

All other portion sizes are based on these portion sizes. For example, goat's milk should receive the same portion size as cow's milk (136 gram).

<b>Food Type</b>	<b>Generic Portion Size (g)</b>
All cereals/grains	36
All flour	23
All meat	15
All offal	8
All pulses and seeds	15
All bread	28
All soft fruit	42
Unripe fruits (banana and papaya)	21
All fats/oils/butter	5
All berries / small/soft fruits	25
All fish	10
All leafy vegetables	15
Large root vegetable	25
Soft vegetables	10
Condiment vegetable	5
Citric fruits	5
Tofu	41
Paste / sauce	5
Cows milk	136
Eggs	20
All cakes	21
All biscuits	11
Coconut milk	5
All spices	1
Salt	0.3

### Annex III – Example of the calculation of income

This example is for the very poor wealth group in Magaria-Kantché irrigated zone, but the other calculations have been done exactly the same way, using the original table with data from the 2009 HEA.

<b>INCOME DATA FROM HEA 2009</b>	<b>Very Poor</b>	<b>Action to take:</b>
Sales of agricultural production	17,920	Adapt using 2011 prices
Sales of livestock products	0	Adapt using inflation figures
Sales of livestock	20,500	Adapt using inflation figures
Employment (e.g. labour) + payments	110,000	Adapt using inflation figures
Auto-employment (e.g. wood / charcoal)	42,000	Adapt using inflation figures
Petty trade or 'social safety nets'	0	Adapt using inflation figures
Other	7,400	Adapt using inflation figures
<b>Income Summary: total (cash per year)</b>	<b>197,820</b>	

<b>Sales of agricultural produce (kg)</b>	<b>Price/100g</b>	<b>Very Poor</b>	
		<b>kg sold</b>	<b>Value</b>
Millet	18.17	0	0.0
Sorghum	18.62	0	0.0
Cowpeas	19.47	45	8,761.5
Peanut	78.31	7	5,481.7
Pumpkin	9.01	5	450.5
Onion	26.89	35	9,411.5
Sugar cane			3,000.0
<b>TOTAL</b>			<b>27,105.2</b>

<b>Adaption rest of income using inflation</b>	<b>Very Poor</b>
Rest income 2009	141,913
Inflation 2010 = 0.9%	
Adjusted rest of income 2010	143,190
Inflation 2011 (Jan-Apr) = 2.1%	
<b>Adjusted rest of income 2011</b>	<b>146,197</b>

<b>Payment-in-kind</b>	<b>Very Poor</b>
Total kg of millet received	300
Value millet (CFA/100g)	18.17
<b>Total value</b>	<b>54,510</b>

<b>Value of food consumed from own production</b>	<b>Price/100g</b>	<b>Very Poor</b>	
		<b>kg eaten</b>	<b>Value</b>
Millet	18.17	263	47,696.3
Sorghum	18.62	38	7,075.6
Cowpeas	19.47	36	7,009.2
Onion	26.89	3	806.7
<b>TOTAL</b>			<b>62,587.8</b>

<b>TOTAL INCOME 2011</b>	<b>Very Poor</b>
Sales of agricultural produce	27,105.2
Adaption rest of income using inflation	185,331
Payment-in-kind	54,510
Value of food consumed from own production	62,587.8
<b>TOTAL</b>	<b>329,534.0</b>