

# COST OF THE DIET ANALYSIS REPORT IN 12 DISTRICTS, 17 LIVELIHOOD ZONES - PAKISTAN



**Nutrition Wing**  
Ministry of National Health Services,  
Regulations and Coordination,  
Government of Pakistan



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for every child







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12 DISTRICTS, 17 LIVELIHOOD ZONES - PAKISTAN





## Acknowledgments

I am grateful to the UNICEF Pakistan team for their enormous support for the Cost of the Diet study and especially to Dr Saba Shuja for making the practical arrangements for training, data collection.

My special appreciation goes to the Research and Development Solutions team and especially to Dr Adnan A. Khan and Safoora Malik for mobilizing the team of data collectors and supervisors.

This analysis would not have been possible without the assistance of the market traders in the 102 villages studied, and of the women who participated in the interviews and focus group discussions. Their time, hospitality and insights are greatly appreciated.

### Mesfin Beyero

Lead researcher



The study has been made possible with the financial assistance of the Department for International Development (DFID), United Kingdom. The views expressed herein should not be taken, in any way, to reflect the official opinion of the DFID.



## Foreword

Appropriate feeding practices are essential for the nutritional status, growth, development and survival of infants and young children. Infants should be exclusively breastfed for the first six months of life, and thereafter should receive nutritionally adequate and safe complementary foods, while breastfeeding should continue up to at least two years. Poor or suboptimal breast feeding practices are important determinants of all forms of undernutrition, especially during the 1000 days of child life. It is recommended that babies should receive complementary foods from six months of age because they require adequate nutritious foods in addition to breast milk.

Complementary feeding is the least explored area as limited data on this subject are available in Pakistan. As part of the National Complementary Feeding Assessment, a Cost of the Diet Analysis has been carried out to determine the accessibility, availability and affordability of nutritious diet. This analysis also includes market and dietary pattern surveys and focus group discussions with mothers and caretakers of children under the age of two years. The study was conducted in geographic areas/districts with the highest burden of stunting and micronutrient deficiencies. The selection of districts was based on vulnerability criteria and included emergency-affected and emergency-prone districts (flood and drought-affected and food insecure) across Pakistan.

The analysis answers the following key questions. What is the cost of a nutritionally adequate diet for typical households? What nutrients have the greatest influence on the cost of a nutritious diet? What local foods are inexpensive sources of essential micronutrients and could be promoted through programme interventions? How affordable is a nutritious diet for a typical household in different wealth groups? How might nutrition, food security and social protection interventions improve access to a nutritious diet by households in the assessment area?

The Nutrition Wing at the Ministry of National Health Services, Regulation & Coordination highly appreciates the financial support by the United Kingdom Department for International Development in conducting this analysis. The efforts of Research & Development Solution in carrying out the fieldwork and the international consultant Mesfin Beyero are also acknowledged. The role and contribution of different stakeholders and partners in carrying out the research and later on review and finalisation of the report is highly appreciated. I would like to mention the hard work put in by the UNICEF team: Ms Melanie Galvin, Dr Wisal Khan and Ms Sumra, as well as my whole team at the Nutrition Wing during the entire process. Special appreciation is due to Dr Saba Shuja of UNICEF and Dr Khawaja Masuood Ahmed from my team for their devoted work and inputs as well as review and finalisation of the document.

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## Acronyms

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<b>BISP</b>	Benazir Income Support Programme
<b>CoD</b>	Cost of the Diet
<b>EO</b>	Energy-only diet
<b>FAO</b>	Food and Agriculture Organization
<b>FGD</b>	Focus Group Discussion
<b>FHAB</b>	Food Habits Nutritious diet
<b>GB</b>	Gilgit-Baltistan
<b>HIES</b>	Household Integrated Economic Survey
<b>hyv</b>	high-yield variety [of wheat]
<b>ICT</b>	Islamabad Capital Territory
<b>KP</b>	Khyber Pakhtunkhwa
<b>MAC</b>	Macronutrient diet
<b>MICS</b>	Multiple Indicator Cluster Survey
<b>NFE</b>	Non-Food Expenditure
<b>NNS</b>	National Nutrition Survey
<b>NUT</b>	Nutritious diet
<b>PDHS</b>	Pakistan Demographic and Health Survey
<b>PKR</b>	Pakistani Rupee
<b>RNI</b>	Recommended Nutrient Intake
<b>UNICEF</b>	United Nations Children's Fund
<b>WHO</b>	World Health Organization



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## Executive Summary

This is the report of the Cost of the Diet Analysis conducted in 17 livelihood zones in 12 districts across four provinces (Balochistan, Khyber Pakhtunkhwa including the former Federally Administered Tribal Areas, now known as the tribal areas of KP, Punjab and Sindh) and three administrative regions (Azad Jammu and Kashmir, Gilgit-Baltistan and Islamabad Capital Territory) of Pakistan. The study was commissioned by UNICEF Pakistan with funding from the Department for International Development of the United Kingdom. The CoD analysis set out to answer the following five questions:

- What is the cost of a nutritionally adequate diet for typical households?
- What nutrients have the greatest influence on the cost of a nutritious diet?
- What local foods are inexpensive sources of essential micronutrients and could be promoted through programme interventions?
- How affordable is a nutritious diet for a typical household in different wealth groups?
- How might nutrition, food security and social protection interventions improve access to a nutritious diet by households in the assessment area?

Prior to the training of the data collection team, lists of foods available in the local markets of the 17 livelihood zones were obtained with the assistance of local experts. Training was given to a team of enumerators and supervisors on how to collect weight and price data from traders and conduct interviews and focus group discussions with mothers of children aged 6–23 months. Research and Development Solutions, a local firm, performed the data collection with close supervision from the UNICEF team. The consultant was responsible for providing day-to-day remote technical assistance. A total of 102 villages were visited; weight and price data of foods available in the local markets where the poor purchase from were collected; 102 focus group discussions were conducted and 816 mothers of children aged 6–23 months were interviewed. The study was conducted during the winter season, and weight and price data for the other three seasons were collected retrospectively. Secondary data on annual income, food and non-food expenditure of five wealth groups was obtained from the Household Integrated Economic Survey of Pakistan. The typical Pakistani family of seven embedded in the software was used as the basis for calculating the daily and annual cost of the diets.

Data were entered by two data entry clerks in the Cost of the Diet Software version 2.3.9 under the close supervision of the consultant. A standard analysis was conducted, including:

- The cost and composition of three different types of diets: Energy-Only (EO), Nutritious (NUT) and Food Habits Nutritious (FHAB) diets;
- Seasonal fluctuations in the cost of the FHAB diet;
- The contribution of food groups to the cost of the FHAB diet; and
- Affordability of the diets for the five wealth groups.

In addition, different interventions were modelled, selected and modified depending on the specific circumstances of the livelihood zone under discussion.



### The main results of the analysis are:

- Availability of nutrient-rich foods is not a key barrier to poor households in obtaining a nutritious diet. The software has identified that recommended intakes of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in local markets unless restricted by economic constraints and cultural practices.
- The FHAB diet is more expensive than the NUT diet, which in turn is more expensive than the EO diet. However, expense and affordability varies depending on the livelihood zone under discussion.
- Among the micronutrients, vitamin B12, calcium and iron i.e. those mainly coming from animal sources, are the hardest to meet using locally-available foods.
- Very poor and poor households cannot afford the FHAB diet in almost all livelihood zones given their current levels of income. In some livelihood zones, only the wealthiest quintile can afford the FHAB diet.
- Some nutritious foods are taboo for pregnant women, lactating mothers and children 6–23 months, and other easily available highly nutritious foods are not eaten due to local dietary practices.
- Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of children aged 12–23 months.

### The main recommendations are:

- Dietary modification is needed to improve the quality, composition and affordability of a nutritious diet. Sorghum, millet, guava (green) and fish (rohu, river, raw) were identified as cheap, nutritious and easily available options that rarely form part of the customary diet, and should be promoted through social behavioural change communication.
- Promoting the self-production of selected crops (such as wheat), vegetables (such as onions, spinach and fenugreek), livestock (buffalo and goat for milk; poultry for eggs) can help improve quality, composition and affordability of a nutritious diet.
- Continuation of breastfeeding to two years of age with appropriate complementary feeding should be promoted through social and behavioural change communication to achieve an increase from the current level of 56 per cent.
- Family planning services that address unmet family planning needs by supporting women in avoiding unwanted pregnancies can help to limit average family sizes to five and thereby improve the quality, composition and affordability of a nutritious diet.
- Social protection schemes should be scaled up to improve affordability of a nutritious diet with specific activities determined on the basis of district-specific household economic studies. In addition, nutrition-sensitive agricultural activities should be implemented alongside social protection schemes to improve dietary diversity.







# Introduction



# 01.

## Introduction

### 1.1 Nutritional status of children and women in Pakistan

Surveys conducted over the last few decades show a deteriorating situation in terms of malnutrition and undernutrition among children and women. According to the National Nutrition Survey (NNS, 2011), an estimated 44 per cent of Pakistani children under the age of five years are stunted. This was confirmed by the most recent Pakistan Demographic Health Survey (PDHS, 2012–2013) which found 45 per cent of children below five years of age are stunted.

There are provincial differences in the levels of undernutrition among children under five years of age. For example, according to recent Multiple Indicator Cluster Surveys (MICS 2014), in Sindh province 48.0 per cent of children are stunted and 42.0 per cent are underweight, while in Punjab these rates are 33.5 per cent and 33.7 per cent respectively (MICS 2014, UNICEF & Bureau of Statistics).

### 1.2 Micronutrient deficiencies

Deficiencies of micronutrients, such as vitamin A, iron/folic, iodine and zinc deficiencies were also highly prevalent among children and women due to poor access and lack of dietary diversity. An estimated 61.9 per cent of preschool children and 50.4 per cent of women are anaemic, while 54 per cent of children and 46 per cent



of women are vitamin A deficient (NNS, 2011). The prevalence of micronutrient deficiencies in children was reported to exceed 50 per cent for even the wealthiest socioeconomic strata and indicates that poor diet quality is a universal concern in Pakistan (MPDR & WFP, 2016). A Cost of the Diet (CoD) analysis conducted two years before this report (CoD, 2016) revealed that the food expenditure of 67.6 per cent of households was below the staple-adjusted nutritious diet threshold, which means two out of three households were not able to afford a nutritious diet with their current food expenditure. The same source indicated micronutrient deficiencies as well as poor dietary diversity were also highly prevalent in women of reproductive age. same source indicated micronutrient deficiencies as well as poor dietary diversity were also highly prevalent in women of reproductive age.

**Table 1.1: Prevalence of micronutrient deficiencies in children and women**

Child micronutrient deficiencies	%
Vitamin A deficiency	54.0
Anaemia	62.0
Zinc deficiency	39.2
Maternal micronutrient deficiencies	
Vitamin A deficiency – pregnant women	46.0
Anaemia – pregnant women	51.0
Zinc deficiency – pregnant women	47.6

Source: NNS, 2011

Chronic malnutrition and micronutrient deficiencies lead to suboptimal brain development and stunted growth, which results in poor school performance, low wages and earning in later life and overall adverse impact on country's productivity and economy.

### 1.3 Infant and young child feeding practices

About 94 per cent of Pakistani children aged 0–23 months are ever breastfed; 18 per cent initiate breastfeeding in the first hour; 38 per cent of children under six months of age are exclusively breastfed, and 56 per cent of children continue breastfeeding to two years of age (PDHS, 2012–2013). Breastfeeding indicators vary greatly among the provinces and administrative areas; however this is partly due to differences in the years of reporting. Analysis of the survey data (PDHS 2012–2013) revealed that only about 22 per cent of children receive minimum dietary diversity, 63 per cent receive the minimum meal frequency and 15 per cent receive the minimum acceptable diet recommended by the World Health Organization (WHO). The same source showed that children aged 18–23 months, from wealthier households, living in urban areas, with both parents educated and whose mothers receive continuum of care, have the highest percentages of all three.

## 02.

## Cost of the Diet Analysis

The prevalence of undernutrition has showed little change in Pakistan over the last several years. Undernutrition levels greatly vary across provinces and regions, but even provinces with surplus food production, lower poverty levels, better access to social services, more equitable land distribution and greater crop diversification have districts with high levels of undernutrition. Some regions (such as Balochistan) are also especially susceptible to natural disasters, which contributes to high levels of undernutrition (University of Sussex, March 2013).

Household food insecurity, lack of a healthy environment and poor caregiving practices due to lack of knowledge and resources contribute to undernutrition, which persists partly due to political and economic structural challenges (University of Sussex, March 2013). The CoD analysis explores the economic constraints, food habits and behaviours that contribute to high levels of macronutrient and micronutrient deficiencies.

The CoD analysis sets out to answer the following key questions:

- What is the cost of a nutritionally adequate diet for typical households?
- What nutrients have the greatest influence on the cost of a nutritious diet?
- What local foods are inexpensive sources of essential micronutrients and could be promoted through programmatic interventions?
- How affordable is a nutritious diet for typical households in different wealth groups?
- How might nutrition, food security and social protection interventions improve access to a nutritious diet by households in the assessment area?

### 2.1 Methods

#### 2.1.1 Geographical areas

CoD assessments were conducted in 12 districts with the highest burden of stunting and micronutrient deficiencies. The districts were selected based on vulnerability criteria and susceptibility to natural disasters such as flood and drought through a consultative process with provinces and administrative regions. If there were two or more predominant livelihood zones in a district, separate CoD assessments were done, as people in a livelihood zone share broadly the same patterns of access to food. Accordingly, a total of 17 assessments in 17 different livelihood zones were conducted in the 12 districts. Table 2.1 indicates the predominant livelihood zones in each district.



**Table 2.1: Assessment districts and livelihood zones**

	Provinces	District	Livelihood zones
1	Khyber Pakhtunkhwa (KP)	Charsadda	Livestock
		Tank	a. Agriculture
			b. Livestock/poultry
2	Islamabad Capital Territory (ICT)	Islamabad	Employment/labour (paid/unpaid)
3	Punjab	Faisalabad	Agriculture
		Rajanpur	Agriculture
4	Azad Jammu and Kashmir (AJK)	Haveli	a. Agriculture b. Livestock/poultry
5	Balochistan	Loralai	Agriculture
		Naseerabad	Agriculture
6	Sindh	Jacobabad	Agriculture
		Sanghar	a. Agriculture b. Livestock/poultry
7	Gilgit-Baltistan (GB)	Gilgit	a. Agriculture
8	Tribal Districts of KP (formerly known as the Federally Administered Tribal Areas)	Khyber	a. Agriculture b. Employment/labour (paid/unpaid)

### 2.1.2 Selection of villages/towns and markets

Once an assessment area (district or livelihood zone) was chosen, all the villages/localities within it were listed and a representative sample of six was selected. This was done by UNICEF and government staff with a good knowledge of the local area. Following the selection of villages or localities, an exhaustive list of markets, big and small, where poor households were known to purchase food, was compiled in consultation with key informants.

### 2.1.3 Developing the food list

An exhaustive list of foods available in local markets of the 17 livelihood zones throughout the year was developed and recorded. The list was prepared prior to the survey by teams of data collectors with good knowledge of the respective districts through discussion with key informants and market traders and using secondary sources. Even if some foods were only available for a limited number of months, they were included in the list. The different varieties of foods were also listed. For example, maize may be white, yellow, green or flour; all were recorded separately. Each food was listed using the English name (the food database in the CoD program lists foods in English) and a local name where appropriate. The list of food groups within the CoD software was utilized to categorize available foods as follows:

- Grains and grain-based products
- Roots and tubers
- Legumes, nuts & seeds
- Meat and offal
- Fish, seafood, amphibians and invertebrates
- Eggs and egg products
- Milk and milk products
- Vegetables and vegetable products
- Fruit and fruit products
- Oils and fats
- Sugars and confectionary
- Spices, condiments & beverages
- Beverages
- Supplements and infant foods
- Composite dishes

The food list database for South Asian countries embedded in the CoD software was utilized to simplify the process. This helped in finalizing the tools both for market surveys and household interviews. The food list was discussed with data collectors during the training and any missed foods were added. The units the foods were sold (e.g. by weight or volume) in was also explored. New foods found at the time of data collection were added and price and weight data collected at the bottom of the market survey sheet under the heading “new foods”.

## 2.2 Data collection

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### 2.2.1 Training and piloting

Training on CoD data collection techniques took place over three days. A training of trainers was conducted in English for a team of trainers who later trained enumerators using the Urdu language on how to conduct market surveys, interviews and focus group discussions (FGDs). A combination of short presentations, practical roleplays and pre-testing of the tools were conducted on the third day. Discussions were held after the pre-testing to clarify the tools and assess challenges faced.

### 2.2.2 Market survey to collect price data

Food price data, along with the corresponding measure in grams or millilitres, was collected from a representative sample of markets within each assessment zone. The markets in these villages were selected to be representative of where poor households in the livelihood zone purchase their food. Because of the challenges of collecting data on all the foods from a single market, small markets in the surrounding areas of larger ones were also included in the survey to ensure inclusion of four traders per food item and to bring more food items into the assessment.

To collect the information needed to estimate the cost of the diet, market traders were asked the price of the smallest unit of each food item that they sold during each season, on the assumption that the poor were

likely to be able to afford only this amount. Poor households typically buy foods in small amounts as they cannot afford bulk purchases.

Three samples of each food item were weighed using electronic and/or manual scales with a precision of 1g. Where possible, in each market, weight and price data were collected from four traders giving a possible total of four prices and 12 weights for each food item found. Market traders were then asked questions about annual trends in prices, seasonality and changes in the demand and supply of commodities. This qualitative data provided important contextual information that was used to inform the results. The quantitative data were entered into the CoD software version 2.3.9, which averaged the price and weight of each food across every market. The final averaged weight and price for each food was then divided to calculate the cost per 100g by season.

Each food item identified in the market survey was then selected from the food composition database in the CoD software, choosing the variety consumed in the South Asian countries nearest to Pakistan if there was more than one type available to select.

These data were collected in winter and retrospective data were elicited for the other three seasons so that a baseline analysis of the preceding year could be produced. Teams were asked the name and length of each season, in reverse order, in the specific livelihood zone studied.

### 2.2.3 Interviews and focus group discussions

Estimating a diet that is nutritious but considers the typical food habits of households in a livelihood zone requires data on how many times a week the software can or cannot include a food. These inputs are called the minimum and maximum food frequency constraints, which need to be determined for each food found on the market. For example, if the minimum constraint for bread, bun or roll (locally known as double roti) is set at 5 and the maximum is set at 14, it means that the software must include double roti in the diet no less than five times a week but no more than 14 times a week, or twice a day. It is important to note that the constraints applied are intended to reflect typical dietary patterns rather than economic constraints, because the CoD is a tool to illustrate a diet that could be achieved if economic limits were removed.

These constraints are created following one-hour interviews based upon a questionnaire and FGDs to understand local dietary patterns. The questionnaire was based upon the food list generated by the market survey and aimed to determine how often the foods were consumed. The questions asked during the FGD were based upon responses to the questionnaire. Information was collected on the foods that infants, young children and pregnant and lactating women were or were not consuming; foraged foods consumed; household production of food; cultural taboos; consumption patterns; and key staples.

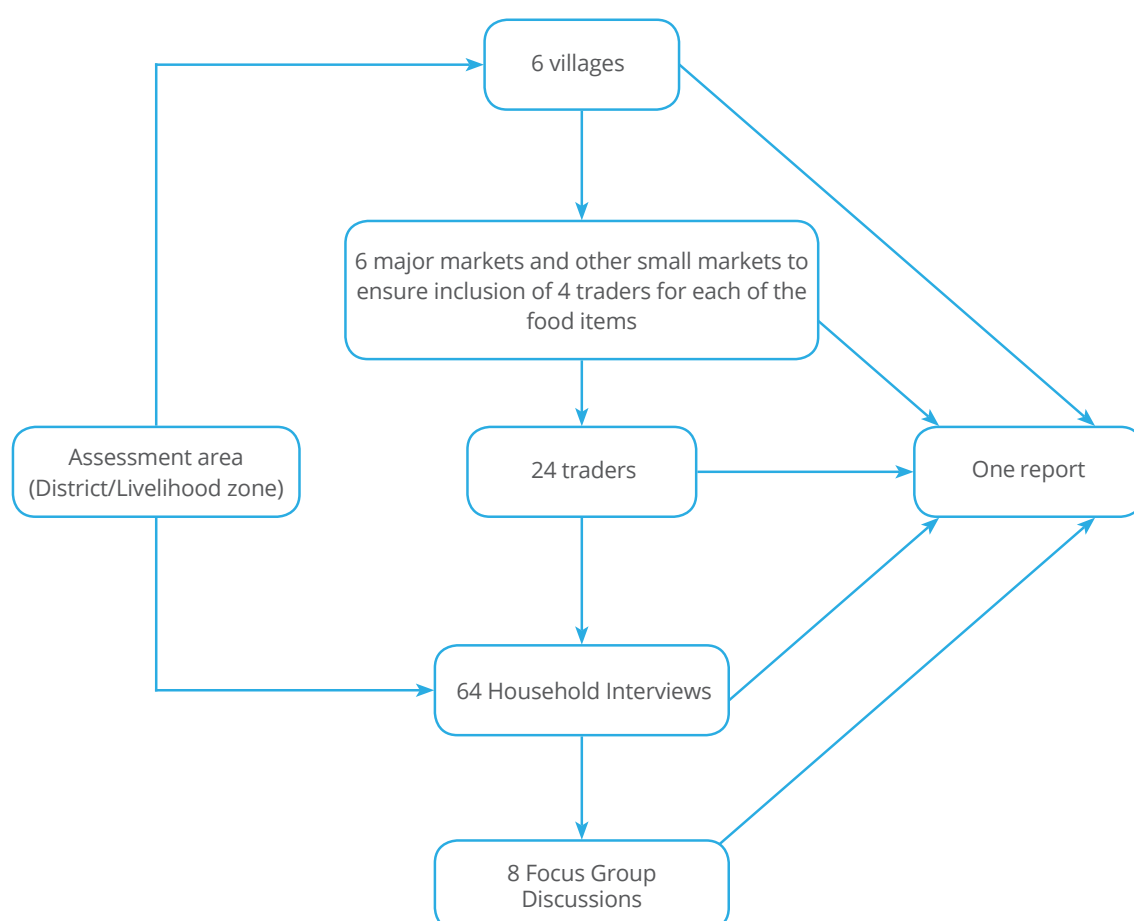
Each group consisted of eight women, including two or three women from each wealth group identified by the Household Integrated Economic Survey 2015–2016 (HIES, 2017), all of whom were responsible for preparing food for the household. During the interview the women were asked to state the frequency with which they ate each item of food on the list. The frequency options given were never (never consuming the food), rarely (eating the food once a month, once a year, or on special occasions), often (eating the food 1–4 days each week), or usually (eating the food five days a week or more). These responses were tallied and the total for each food item from all eight respondents was then calculated. This value was used to set the inputs on the frequency with which foods are eaten, called consumption constraints, in the software. Higher scores mean that a food is consumed more frequently while lower scores indicate that a food is consumed less frequently or never consumed at all.

Using the market and food consumption data, the costs of four theoretical diets were estimated using the CoD software: a diet at lowest cost that meets only the recommended average energy requirements of the individual or family (energy-only or EO diet); a lowest-cost diet that meets recommended intakes for energy, protein and fat of the individual or family (Macronutrient or MAC diet); a lowest-cost diet that meets the recommended intakes for energy, protein, fat, and all micronutrients specified for the individual or family regardless of real-world dietary habits (nutritious or NUT diet); and a lowest-cost “nutritious” diet that meets the recommended intakes for energy, protein, fat and all micronutrients specified for the individual or family based upon typical dietary habits of households in the livelihood zone under discussion (locally-appropriate cost-optimized nutritious diet, in this report called the food habits nutritious or FHAB diet).

The average cost of each diet is given in Pakistani Rupees (PKR), rounded to the nearest 0.01 PKR.

The following flow diagram illustrates the total number of villages, markets, traders and women for household interviews and FGDs included in the assessment of a single district or livelihood zone.

Figure 2.1: Villages, markets, traders, interviews and focus groups in an assessment area





### 2.3.4 Specification of a typical family

A typical household was specified according to a “typical” family of seven individuals reflecting the typical household structure in Pakistan. The typical CoD family for a seven-person household comprises:

- An adult woman, aged >60 years, moderately active
- An adult man, aged 30–59 years, 50 kg, moderately active
- An adult woman, aged 30–59 years, 45 kg, moderately active
- A child (either sex), aged 12–13 years
- A child (either sex), aged 10–11 years
- A child (either sex), aged 8–9 years
- A child (either sex), aged 12–23 months

## 2.3 Recommended intakes

The needs of individuals for energy, protein, and micronutrients were taken from a database embedded in the CoD software that specifies the estimated average requirement recommended by WHO and Food and Agriculture Organization (FAO) for individuals by age, sex and activity level. A diet selected by the CoD software that meets all the requirements described above is called a “nutritious” diet.

## 2.4 Affordability of diets

### 2.4.1 Estimating affordability according to annual income

The cost of a nutritious diet becomes a more meaningful figure when compared with the income and purchasing power of the poorest members of the community. A diet may be inexpensive in comparison to other contexts, but if it is beyond the means of the poor, then the risk of undernutrition remains.

Data on estimates of cash income are taken from HIES 2015–2016 conducted by the Pakistan Bureau of Statistics (HIES, 2017).<sup>1</sup> According to this report, the average annual income for people from very poor households (first quintile) is 236,904 PKR, and for people from wealthy households (fifth quintile) is 725,412 PKR (Table 2.2). The averages from the urban and rural was taken for all the livelihood zones.

**Table 2.2: Total household income and non-food expenditure, by wealth group**

	Very poor	Poor	Middle	Better off	Wealthy
Annual income (PKR)	236,904	285,912	336,240	404,016	725,412
Annual Non-Food Expenditure (PKR)	139,830	172,927	201,890	236,908	399,977

Source: HIES 2015–2016.

<sup>1</sup> Household Integrated Economic Survey (HIES), Government of Pakistan, Statistics Division Pakistan Bureau of Statistics, Islamabad, February 2017.

### 2.4.2 Estimating affordability after accounting for total household expenditure

Households have many needs in addition to food, some of which are critical for their survival. The non-food expenditure is defined as the annual cost of essential non-food items required by each specified wealth group. According to the HIES 2015–2016 report, food expenditure constitutes 37.05 per cent of all household expenses.

Comparing the total household expenditure with the annual cost of the nutritious diet calculated by the software gives an indication of the amount households have available to spend on food and whether they can afford to satisfy their minimum nutritional requirements.

### 2.4.3 Diets calculated by CoD

The CoD software calculates four types of diets. The term “diet” is used here to describe the foods selected by the software to meet the recommended intakes of energy, protein, fat and micronutrients based on specifications to limit the intake of foods and nutrients to avoid toxicity. The software calculates a diet at lowest cost that meets the specification for the individual or family under discussion. The definitions of these diets are presented below:

**Energy-only diet (EO):** meets only recommended average energy specifications for the individual or family under discussion.

**Macronutrient diet (MAC):** meets recommended intakes for energy, protein and fat for the individual or family under discussion.

**Nutritious diet (NUT):** meets recommended intakes for energy, protein, fat and 13 micronutrients for the individual or family under discussion.

**Food habits nutritious diet (FHAB):** meets recommended intakes for energy, protein, fat and 13 micronutrients based upon typical dietary habits of households in the assessment district or livelihood zone for the individual or family under discussion.

While all four diets were analysed in this study, the report focuses on the affordability of two key diets: NUT and FHAB, with additional discussion of EO diets for the purpose of comparison.

## 2.5 Modelling nutrition, food security and social protection interventions

The CoD software can be used to examine the effect of changing variables and assumptions on the cost and affordability of the FHAB diet. For example, it can model the potential effect of new or existing nutrition, food security and social protection interventions; the potential effect of changing the nutrient specifications for specific individuals or households; and the potential effects of sudden shock and current infant and young child feeding practices on the cost, quality, composition and affordability of a nutritious diet. Such models can illustrate the potential for activities to improve the diet either through nutritional interventions or by poverty alleviation strategies. The models presented can help to generate ideas and test assumptions about the impact of activities on household nutrition, and to set targets and indicators. All the models described in the study are theoretical and the situation will be influenced by numerous external factors that cannot be included in the model, so the actual effect on the cost of the diet may be different.

Three or four interventions from the following list are modelled for each livelihood zone after being adapted to local circumstances and needs:

- Scaling up of social safety net programmes, increase in minimum wage;
- Dairy goat farming;
- Rearing poultry;
- Rearing livestock or buffalo;
- Cultivation of vegetables with high nutritional value in kitchen gardens or urban gardens;
- Cultivation of wheat;
- Changing dietary patterns to include available foods with high nutritional value; and
- Limiting the average family size to five.

## 2.6 Strengths and limitations of the study

The Cost of the Diet method and software was developed to apply linear programming to better understand the extent to which poverty may affect people's ability to meet their nutritional specifications.

### Strengths

- This was the first ever countrywide cost of diet study, based on primary data collection.
- The Cost of the Diet method and software can be used to inform programme design and behaviour change communication in the fields of nutrition, food security, livelihoods and social protection as well as to influence policies and advocacy debates on the financial cost of meeting energy and nutrient specifications.

### Limitations

- The quality of data might not be as good as a longitudinal study. This is because traders were expected to remember the price and availability of foods in the other three seasons of the year (recall bias).
- The sampling used by the study is not representative of Pakistan as it is not random and has selected districts with highest levels of undernutrition.
- The cost of some food items that are produced at home and consumed might not be considered in the analysis as these were not quantified. This will result in an increased cost of the diet, and could be corrected with a household economic study.
- The types of foods consumed might change significantly during the extreme weather fluctuations between winter and summer, affecting cost.
- The study did not take into account existing social protection schemes when doing the analysis.
- Wealth patterns vary substantially across districts, and actual wealth quintiles may not reflect the averages used in this report. Thus, in impoverished districts, affordability gaps may be greater on the ground than this study suggests.







A collage of fresh food items. In the top left, there are several pieces of raw red meat on a wooden cutting board, garnished with a sprig of fresh green herbs. To the right, a large piece of raw salmon with its skin is shown, also garnished with a sprig of green herbs. In the bottom left, there are three brown eggs. In the bottom right, there is a piece of cooked chicken on a wooden plate, garnished with a sprig of green herbs. The background is a dark, textured surface.

# Cost of the Diet Analysis in Khyber Pakhtunkhwa (KP) Province



## 03.

## Cost of the Diet Analysis in Khyber Pakhtunkhwa (KP) Province

### 3.1 Charsadda district, livestock/poultry livelihood zone

#### 3.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Sadairo, Umerzai, Utmanzai, Rajar, Batgram and Tarnab. The reference year selected for data collection was 16 February 2017 to 15 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 November 2017 to 15 February 2018
- Season 2 (Autumn): 1 September 2017 to 31 October 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 16 February 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.1.

#### 3.1.2 Availability of foods in the local markets

The data collection team found 116 foods were available in the markets of the six villages of the livestock/poultry livelihood zone in Charsadda district:

- 16 types of grains and grain-based products,
- 7 types of roots and tubers,
- 14 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 3 varieties of fish and seafoods,
- 2 varieties of eggs,
- 4 types of milk and milk products,
- 14 types of vegetables,
- 11 types of fruits,
- 5 types of fats/oils,

- 9 types of sugars and confectionary,
- 19 varieties of herbs, spices and condiments including salt,
- 6 types of beverages, and
- 2 composite dishes.

### 3.1.3 Typical food consumption habits and food taboos

The interviews and FGDs found that wheat (in the form of bread or roti) is the staple food in the assessment area and is eaten five or more times in a week. Wholegrain flour (referred to as “ground flour”) was reported to be more expensive and households tend to use the white flour referred to as “market flour”.

The women in the FGD spoke about dietary habits frequently practised during pregnancy, breastfeeding, for children aged 6–23 months and for household members suffering from illness. In some communities, egg is believed to be harmful to the foetus and papaya is believed to cause miscarriage. There is nothing special that is given to pregnant women and lactating mothers, and women generally eat whatever the rest of the family eat. In other communities, cooked liver and fruits are eaten more frequently during pregnancy, and women are encouraged to eat more vegetables and drink milk and other fluids during lactation. The women also said foods are frequently cooked for male members of the household and children, suggesting that the food preferences of these groups are primarily followed.

Children aged 6–23 months are mostly fed on potatoes, rice and buffalo milk. They are also given sweets and cakes and some fruits like banana are believed to cause cough.

People suffering from illness are given broth made from bones, liquors made from herbs and eggs, which are believed to facilitate recovery.

Nearly all the FGD participants in the six villages acknowledged that a variety of foods are available in the market, however, some of them are not affordable by the very poor and poor. They also reported that they used to be supported by the Benazir Income Support Programme (BISP) which has now stopped. Households also reported that they grow a variety of vegetables, such as cauliflower, in kitchen gardens.

The food taboos described above indicate cost is not the only factor that influences consumption. Although these foods are available in the market, they are not consumed because of local dietary habits.

### 3.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 3.1.1).

Table 3.1.1: Charsadda livestock/poultry zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	2	2	94.32
Macronutrients diet (MAC)	Yes	6	4	130.28
Nutritious diet (NUT)	Yes	14	10	327.11
Food habits nutritious diet (FHAB)	Yes	24	12	460.73

\* Averaged across seasons.

### 3.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated at 94.32 PKR per day, irrespective of the season, and features only one of the 116 foods found in the markets of the six villages, excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 34,400 PKR (Annex 3.1-1).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the extra energy and nutrients required by the lactating mother each day. The key food in the EO diet that was selected by the software is sago palm starch.

Although the EO diet meets the recommended nutrient intake (RNI) for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely solely on this diet for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. RNIs for vitamins including vitamins A and C, and minerals including iron and calcium, are not met by this diet (Annex 3.2-1).

### 3.1.6 Nutritious diet

A NUT diet that meets the average energy requirements and the RNIs for micronutrients is estimated to cost a minimum of 324.87–329.18 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-1).

The NUT diet includes 13 of the 116 foods known to be eaten by people in the livestock/poultry zone of Charsadda district; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat flour (whole, brown) was selected by the software as an inexpensive and rich source of protein, vitamin B1, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Ghee (cow) was selected as an inexpensive source of fat and vitamin A and provides most of these nutrients in the diet (Table 3.1.2).



Table 3.1.2: Charsadda livestock/poultry zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	energy	% energy	protein	% protein	fat	% fat	vit A	% vit A	vit C	% vit C	vit B1	% vit B1	vit B2	% vit B2	niacin	% niacin	vit B6	% vit B6	folic acid	% folic acid	vit B12	% vit B12	calcium	% calcium	iron	% iron	zinc	% zinc		
Baking powder	10	0.4	1 114	0.9	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.0	0.0	0.0	0.0	0.0	0.0			
Breastmilk	194	8.2	0	0.0	2.3	1.3	5.6	5.1	7.0	0.8	2.0	1.2	0.5	1.7	3.4	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.7	0.7	0.0	0.0		
Soybean, dried, raw	32	1.4	3 885	3.3	2.6	6.7	4.8	0.0	0.0	4.8	4.9	3.8	3.5	3.3	0.0	2.9	5.1	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	2.9	5.1	5.8	5.8	5.8	5.8	0.0	0.0	
Ghee, cow	67	2.8	8 668	7.3	11.2	0.0	49.3	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.9	0.0	0.0	0.0	0.0		
Milk, cow, whole fat, pasteurized, UHT	525	22.1	41 501	34.8	6.2	10.1	14.5	8.6	9.4	6.6	43.4	5.9	7.1	4.5	86.6	20.4	1.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	86.6	20.4	1.5	7.5	7.5	7.5	7.5	0.0	0.0	
Horseradish	73	3.1	1 123	0.9	0.5	0.9	0.2	1.3	6.6	1.0	2.2	1.0	1.1	2.4	0.0	1.3	1.3	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.0	1.3	1.3	0.9	0.9	0.9	0.9	0.0	0.0	
Millet, pearl, local	140	5.9	8 840	7.4	9.4	10.2	5.2	0.7	0.0	7.4	9.7	11.4	10.4	4.5	0.0	2.2	15.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	0.0	2.2	15.7	13.7	13.7	13.7	13.7	0.0	0.0	
Spinach, raw	280	11.8	13 659	11.4	1.4	5.2	1.0	59.8	53.3	1.7	7.6	5.8	14.1	54.9	0.0	9.5	8.8	7.9	7.9	7.9	7.9	7.9	7.9	7.9	0.0	9.5	8.8	7.9	7.9	7.9	7.9	0.0	0.0	
Guava, green	10	0.4	582	0.5	0.1	0.1	0.0	0.2	20.8	0.4	0.3	0.2	0.3	0.5	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Fish, rohu, river, raw	16	0.7	4 672	3.9	0.3	1.6	0.3	0.0	0.0	0.2	0.3	1.4	0.5	0.0	0.0	0.8	3.9	1.1	0.6	0.3	0.3	0.3	0.3	0.0	0.8	3.9	1.1	0.6	0.3	0.3	0.3	0.3		
Sago palm, starch	89	3.7	2 213	1.9	6.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.3	0.3	0.3	0.3	0.3		
Sorghum, grain or flour, local	325	13.7	9 245	7.7	20.1	20.5	5.7	0.5	0.0	15.9	7.8	19.7	12.5	3.6	0.0	1.8	18.7	8.2	8.2	8.2	8.2	8.2	8.2	0.0	1.8	18.7	8.2	8.2	8.2	8.2	8.2	0.0	0.0	
Bay leaf, dried	7	0.3	1 558	1.3	0.5	0.3	0.4	1.1	2.9	0.0	0.9	0.4	3.1	1.3	0.0	2.2	4.2	0.8	0.8	0.8	0.8	0.8	0.8	0.0	2.2	4.2	0.8	0.8	0.8	0.8	0.8	0.0	0.0	
Wheat, flour, brown, whole (Wheat, wholegrain, raw)	609	25.6	22 333	18.7	39.0	42.7	13.0	0.1	0.0	60.9	21.0	49.2	46.9	23.3	0.0	9.4	41.8	53.5	53.5	53.5	53.5	53.5	53.5	0.0	9.4	41.8	53.5	53.5	53.5	53.5	53.5	53.5	0.0	0.0
Total	2 377	100	119 394	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
% target met					100	186	100	126	100	179	119	191	121	106	100	102	100	100	100	100	100	100	100	100	100	100	102	100	100	100	100	100	195	

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Charsadda are indicated in Annex 3.4-1. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12, calcium and iron are met only to about 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 3.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the livestock/poultry livelihood zone of Charsadda but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 456.60–472.08 PKR per day. As with the NUT diet above, lactating mothers are the most expensive family members, requiring nearly twice the amount of cash their husbands need to fulfil their nutritional needs (Annex 3.5-1).

Table 3.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to micronutrient needs for a typical family in Charsadda district's livestock/poultry livelihood zone.

Twenty of the 116 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat flour (brown) is an important source of protein, energy, vitamin B1, niacin, vitamin B6, iron and zinc and provides most of these nutrients; dairy products i.e. whole cow milk is an important source of protein, vitamins B2 and B12 and calcium; spinach is an important source of vitamin A, vitamin C and folic acid; vegetable ghee is an important source of fat; and baking powder is an important source of calcium.

Table 3.1.3: Charsadda livestock/poultry zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with the percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (Kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	311	10.8	18 184	10.8	19.4	25.0	4.7	0.1	0.0	33.9	14.9	30.4	27.9	7.9	0.0	6.3	21.4	30.0
Wheat, flour, white	131	4.5	7 441	4.4	8.4	9.8	1.5	0.0	0.0	3.7	2.0	8.2	2.8	2.3	0.0	0.6	7.0	6.4
Baking powder	9	0.3	1 006	0.6	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.6	0.0	0.0
Breastmilk	194	6.7	0	0.0	2.3	1.4	5.4	4.9	4.3	0.9	1.9	1.3	0.4	1.4	3.4	2.1	0.0	0.7
Tea, powder	6	0.2	3 874	2.3	0.4	0.9	0.0	0.0	0.0	0.0	1.8	1.1	0.5	0.6	0.0	0.3	0.2	0.3
Cookies (bakery)	37	1.3	6 064	3.6	3.3	1.3	5.6	0.2	0.0	0.3	0.5	1.3	0.5	0.4	0.6	0.3	7.2	0.5
Ghee, vegetable	65	2.3	11 133	6.6	10.9	0.0	46.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1
Egg, chicken, domestic, cooked	5	0.2	1 999	1.2	0.2	0.6	0.5	0.6	0.0	0.2	0.5	0.3	0.2	0.2	2.5	0.1	0.7	0.4
Ghee, cow	13	0.5	1 714	1.0	2.2	0.0	9.5	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Milk, cow, whole fat, pasteurized, UHT	451	15.7	35 673	21.2	5.3	9.9	12.1	7.1	4.9	6.2	35.1	5.4	5.3	3.3	74.4	17.9	1.3	6.5
Beef mince, lean, raw	16	0.5	6 307	3.8	0.4	2.3	0.6	0.0	0.0	0.1	0.7	1.5	1.4	0.1	5.7	0.1	2.6	2.6
Turneric, dried	8	0.3	4 387	2.6	0.5	0.4	0.5	0.0	0.0	0.2	0.4	0.6	3.2	0.3	0.0	0.5	3.7	1.0
Horseradish	467	16.2	7 526	4.5	3.0	6.3	1.0	7.9	25.6	7.3	13.1	6.9	6.2	13.4	0.0	8.3	8.5	5.9
Cumin, seeds	1	0.0	1 257	0.7	0.1	0.2	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.5	0.8	0.2
Fenugreek, leaf	44	1.5	3 967	2.4	0.3	1.2	0.1	5.8	8.0	0.9	2.4	0.9	5.2	4.0	0.0	3.6	1.9	0.6
Salt	3	0.1	51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Egg, chicken, farmed, raw	28	1.0	8 884	5.3	0.7	2.9	1.8	2.3	0.0	1.2	3.2	1.5	0.9	1.2	13.3	0.0	3.0	2.1
Spinach, raw	286	10.0	13 921	8.3	1.4	6.0	1.0	58.9	33.2	1.9	7.3	6.3	12.3	48.5	0.0	9.9	9.0	8.2
Spearmint leaf, raw	2	0.1	866	0.5	0.0	0.0	0.0	0.1	0.3	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.5	0.1
Sago palm, starch	231	8.0	5 781	3.4	16.4	0.5	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	1.6	0.7
Chilli, red, dry	6	0.2	2 649	1.6	0.4	0.7	0.3	2.4	1.7	1.3	0.8	0.9	3.5	0.6	0.0	0.4	0.2	0.5
Bay leaf, dried	6	0.2	1 462	0.9	0.4	0.4	0.4	1.0	1.7	0.0	0.8	0.4	2.5	1.0	0.0	2.1	3.9	0.8
Tomato, ripe	195	6.8	10 869	6.5	0.8	1.2	0.4	4.3	20.4	2.6	2.8	2.2	3.4	2.6	0.0	0.4	1.4	0.6
Wheat, flour, brown, wholegrain (wheat, whole, raw)	358	12.5	13 153	7.8	22.9	28.6	7.5	0.1	0.0	39.0	11.6	30.8	23.7	11.9	0.0	5.7	24.6	31.8
Total	2 877	100	168 166	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	164	103	131	164	164	126	179	141	123	100	100	100	193

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet the RNI for energy, vitamin B12, calcium and iron is only just met for the CoD family in all seasons of the year. The RNI for all other nutrients is comfortably exceeded, and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-1).

### 3.1.8 Seasonal fluctuations in the food habits nutritious diet

There is no major seasonal fluctuation in the daily cost of the FHAB diet, though prices are slightly higher in autumn and lower in spring.

### 3.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Staple foods i.e. grain and grain-based products, followed by dairy products, are the costliest elements of the FHAB diet for a family in the livestock/poultry livelihood zone of Charsadda district (Annex 3.7-1). This is because these foods were included in the diet in large quantities to meet nutrient targets and therefore contribute the most to its cost while being the least expensive. Households thus rely on these staple foods to provide most of their caloric and nutritional needs.

In the FHAB diet for the child aged 12–23 months, breastmilk makes a significant contribution to nutrient requirements, contributing more than one-third (38 per cent) of the total energy needs of the child as well as 53 per cent of fat, 24 per cent of protein, 41 per cent of vitamin A, 57 per cent of vitamin B12 and 30 per cent of calcium needs. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) and spinach were selected by the software as important sources of iron.

### 3.1.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 3.1.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB is not affordable for very poor, poor and middle households while even the NUT diet is not affordable for very poor and poor households.



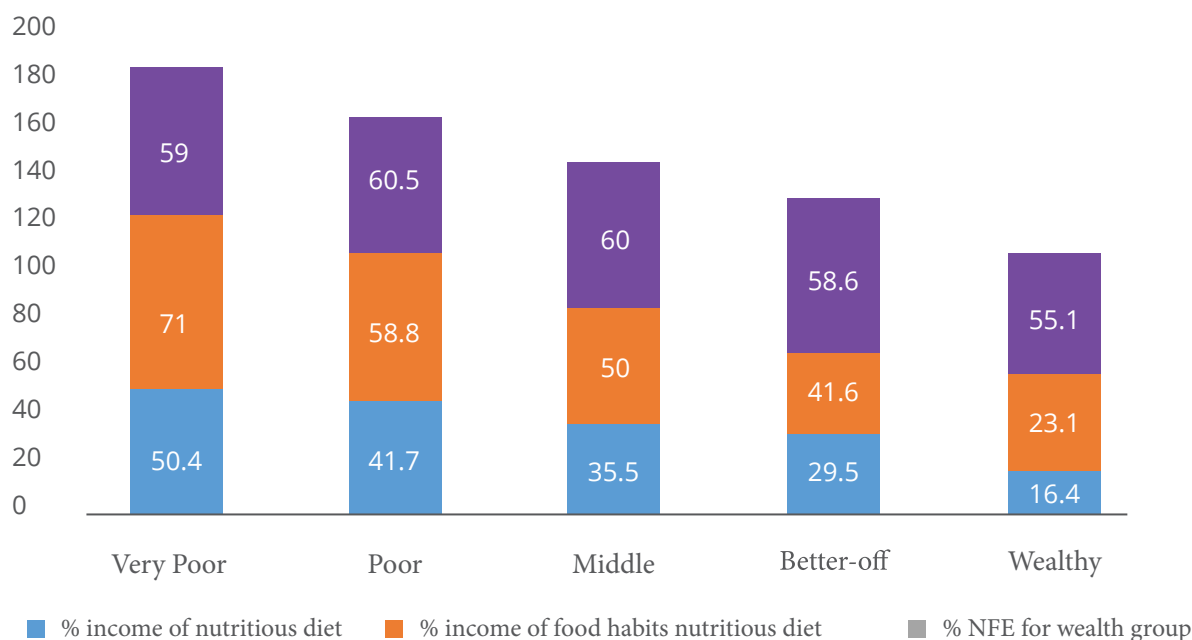
Table 3.1.4: Charsadda livestock/poultry zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	119,394	50.4	168,166	71	139,830	59.0
Poor	285,912	119,394	41.7	168,166	58.8	172,927	60.5
Middle	336,240	119,394	35.5	168,166	50	201,890	60.0
Better-off	404,016	119,394	29.5	168,166	41.6	236,908	58.6
Wealthy	725,412	119,394	16.4	168,166	23.1	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 3.1.1 visually represents the affordability analysis for the five wealth groups in Charsadda's livestock/poultry livelihood zone based upon the numbers presented in Table 3.1.4 above. The results show that only the better-off and wealthy can afford the FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, other households cannot afford it, with an affordability gap (expressed as a percentage of income) of 30 per cent, 20 per cent and 10 per cent for very poor, poor and middle wealth groups respectively. The additional amount of money required per year by very poor, poor and middle households to afford the FHAB diet plus non-food expenditure is 71,090 PKR, 55,180 PKR and 33,820 PKR respectively.

Figure 3.1.1: Charsadda livestock/poultry zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 3.1.11 Modelling nutritional interventions

Three interventions were modelled to examine the effects on the composition and cost of the diet.

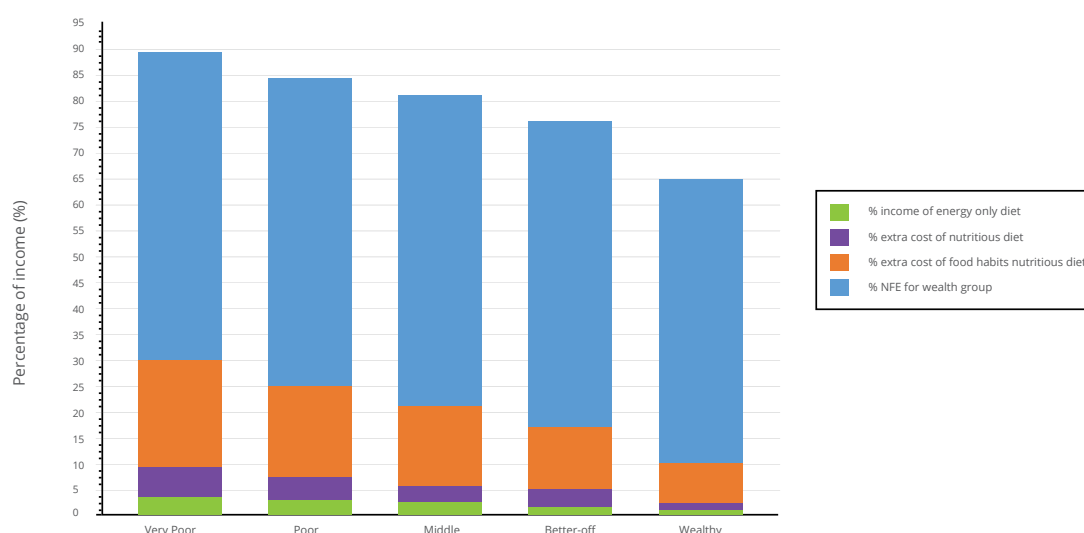
#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Charsadda district's livestock/poultry livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is 30 per cent and 20 per cent of income, respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district. Activities could be identified through district-specific household economic approach studies.

#### Model 2. The impact of livestock/poultry keeping on the cost, quality, composition and affordability of a FHAB diet.

The software included eggs (both from native and farmed chickens) and whole cow milk in the FHAB diet as important sources of vitamin B12, calcium and protein. These foods also contribute significantly to the cost of the FHAB diet. The model brings down the cost of cow milk and eggs to zero to mimic self-production at household level. The model assumes provision of inputs such as chicks and livestock at the start of the programme. It will have dual impact if enough of the food is produced to enable some to be sold to generate income and some to be consumed by the household. The self-production of milk and eggs lowers the annual cost of the FHAB diet to 71,265 PKR. The total food and non-food expenditure become less than 90 per cent of the combined income of the very poor, making it affordable (Figure 3.1.2).

Figure 3.1.2: Charsadda livestock/poultry zone: Affordability of EO, NUT and FHAB diets with self-production of milk and eggs



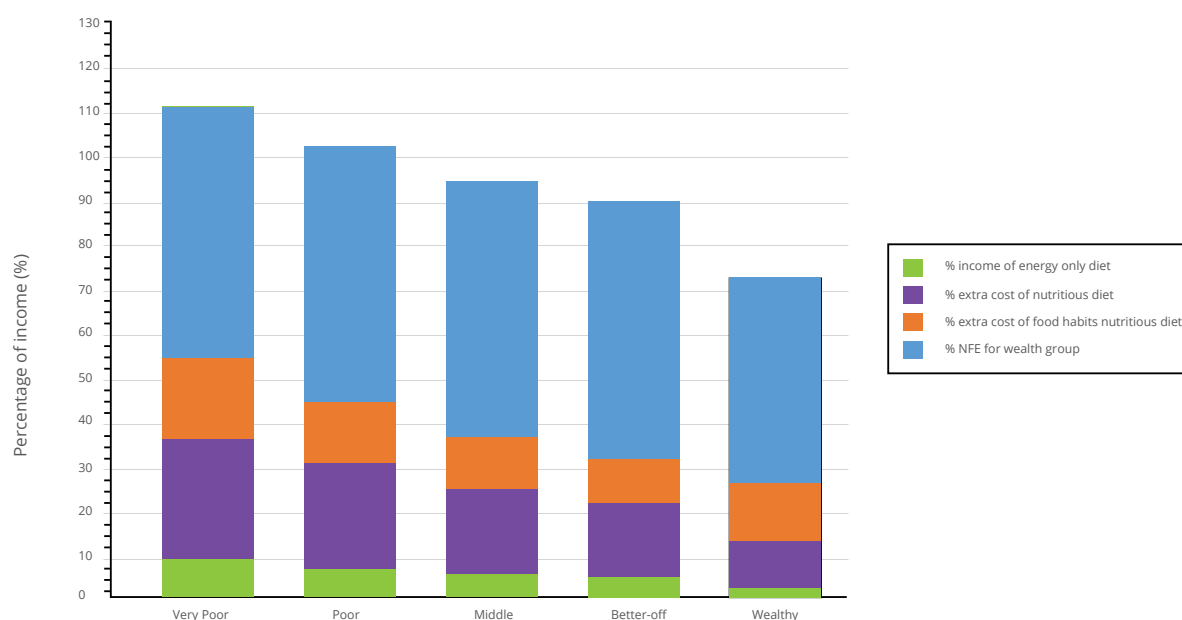
<sup>2</sup>However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 168,200 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced, to 125,500 PKR, which is affordable for middle households, and leaves only a 12 per cent and 4 per cent gap for the very poor and poor respectively (Figure 3.1.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 3.1.3: Charsadda livestock/poultry zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 3.1.12 Key findings

#### **The FHAB diet is over five times more expensive than a diet that only meets energy requirements.**

The results from the cost of the three diets indicate that the NUT diet is five times as expensive as the EO diet, meaning that it costs five times as much to meet the recommended protein, fat and micronutrient requirements compared with only meeting energy requirements, but without considering food habits. Once the latter are introduced, the resulting FHAB diet is 1.4 times more expensive than the NUT diet, showing that the constraints applied to reflect typical dietary habits required the software to add more expensive foods to meet the RNIs of the typical CoD family.

#### **In a NUT diet, ghee (cow) and wheat flour (brown) provide most of the essential micronutrients in Charsadda district.**

However, this is a hypothetical diet, that only gives an indication of which foods found on the local market are the least expensive and most nutritious. Thus, five times the amount of ghee (cow) and almost twice the amount of wheat flour (brown, whole) is included compared to the FHAB diet. While these are locally-available inexpensive sources of fat, vitamin A, iron and zinc, they need to be consumed in large quantities to meet RNIs which may be unrealistic for poor households and considering local dietary habits. According to FGD participants, wholegrain flour is expensive and they tend to use white or “market” flour.

#### **Vitamin B12, calcium and iron are the hardest nutrients for the software to meet using locally-available foods.**

The software met specifications for vitamin B12 and calcium only by 100 per cent in the NUT diet, however by only just meeting this requirement, these nutrients are shown to be the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

#### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software identified that the recommended intakes of energy, protein, fat, all nine vitamins and four minerals can be met using foods available in the local market. No mineral or vitamin has been met at less than 100 per cent of RNI using foods from local markets. The foods selected by the software were all available in almost all markets visited and are therefore considered to be available in the livestock/poultry livelihood zone of Charsadda district. FGD participants also confirmed availability of varieties of food in the market and are instead limited by economic capacity. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

#### **Very poor, poor and middle households cannot afford a FHAB diet.**

A comparison between the annual household income, non-food expenditures and the annual costs of the three diets indicates that very poor, poor and middle households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and select foods that are more expensive in order to comply with local dietary habits.



### Some nutritious foods are taboo for pregnant women and lactating mothers.

Food consumption depends not only on affordability but also local traditions and culture. Some foods, such as papaya and eggs, are taboo for pregnant women for they are believed to cause miscarriage or to be bad for the foetus. Banana is believed to cause coughing in children aged 12–23 months.

### Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## 3.1.13 Conclusions and recommendations

### Conclusions

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements for energy and micronutrients.
- The analysis shows the importance of breastfeeding with appropriate complementary feeding to a child aged 12–23 months.
- Some food taboos were reported, indicating that interventions based on food or nutrients alone will be insufficient and behavioural modification is necessary to promote dietary diversity and prevent stunting.

### Recommendations

#### Dietary modification is needed to improve the quality, composition and affordability of nutritious diets.

The CoD analysis indicates ghee (cow) and wheat flour (whole, brown) are good sources of macro- and micronutrients at minimum cost, however, they are not frequently consumed. Promoting the frequent consumption of these foods through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family that lactating mothers require additional accommodation by increasing the amount, frequency and variety of foods.

Promoting self-production of cow milk and poultry can help improve the quality, composition and affordability of nutritious diets in this area.

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutritional outcomes. CoD modelling shows that self-production of milk and eggs lowers the annual cost of the FHAB diet so as to make it affordable even for the very poor.

#### Continuation of breastfeeding to two years should be promoted.

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given

the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 30 per cent and 20 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes aimed at the very poor and poor will allow households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## **3.2 Tank district, agriculture livelihood zone**

### **3.2.1 Market survey to collect price data**

Surveys were conducted in the following six villages: Bara Khel, Gul Imam, Mamraz Pathan, Manji Khel, Mumraz Baloch and Shah Alam. The reference year for data collection was 16 March 2017 to 15 March 2018. The team was asked the name and length of each season, in reverse order. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 15 March 2018
- Season 2 (Autumn): 1 October 2017 to 15 November 2017
- Season 3 (Summer): 1 May 2017 to 30 September 2017
- Season 4 (Spring): 16 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item, can be found in Annex 1.2.

### 3.2.2 Availability of foods in the local markets

The data collection team found 111 foods are available in the markets of the six villages of the agriculture livelihood zone in Tank district:

- 19 types of grains and grain-based products,
- 6 types of roots and tubers,
- 8 types of legumes, nuts and seeds,
- 2 varieties of meat and offal,
- 4 varieties of fish and seafoods,
- 2 varieties of eggs,
- 4 types of milk and milk products,
- 13 types of vegetables,
- 16 types of fruits,
- 6 types of fats/oils,
- 8 types of sugars and confectionary,
- 18 varieties of herbs, spices and condiments including salt,
- 4 types of beverages, and
- 1 composite dish.

### 3.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten daily. Most of the women said white wheat flour is cheaper and better to prepare bread from, and wholegrain wheat flour is generally reported to be expensive. Corn was said to be unavailable or expensive. Some also expressed their dislike of corn and said that it is mainly used to feed animals.

All the women in the FGDs said there are no special foods that are given to pregnant women or lactating mothers who eat whatever other members of the family eat. The women also said they are poor and their economic status does not allow them to consume a variety of foods. Some foods such as meat, egg, millet, spinach and cabbage are believed to cause abdominal upset for mothers and babies and are not consumed by breastfeeding mothers. There are no foods that were reported to be taboo for pregnant women.

Children aged 6–23 months are mostly fed potatoes, bananas and khichri (a mixture of rice, lentils and meat). Eggs, beef, mutton, fish, spinach and radish are believed to cause abdominal upset (diarrhoea) in these children and are therefore not given to them.

People suffering from illness are given broth, and soft and sweet foods.

Nearly all the FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables. Some households reported self-production of wheat and milk on land they own or lease, and from animals they keep, respectively.

The food taboos described above indicate cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 3.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 3.2.1).

Table 3.2.1: Tank agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	141.76
Macronutrients diet (MAC)	Yes	4	3	161.62
Nutritious diet (NUT)	Yes	15	10	319.69
Food habits nutritious diet (FHAB)	Yes	24	10	513.31

\* Averaged across seasons.



### 3.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy need is estimated to range between 140.13 PKR and 143.31 PKR per day and features only two of the 111 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 51,800 PKR (Annex 3.1-2).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the cost of the solid and semi-solid complementary foods the child is given; it does not include the cost of breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key foods in the EO diet that are selected by the software are sorghum (raw) and wheat (local or high-yield varieties/hyv).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely solely on this diet for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For a CoD family in Tank district's agriculture livelihood zone across all seasons, RNIs for fat, vitamins including vitamin A, vitamin B2, folic acid, vitamin B12 and vitamin C, and minerals including calcium and iron, are not met by this diet (Annex 3.2-2).

### 3.2.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 315.57–326.74 PKR per day, depending on the season. Lactating mothers are indicated as the most expensive family members (Annex 3.3-2).

The NUT diet includes 14 of the 111 foods known to be eaten by people in the agriculture zone of Tank district; however, some of these foods would have to be eaten in large quantities, i.e. three times daily which is impractical. Wheat (local or hvv) was selected by the software as an inexpensive and rich source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides the majority of these nutrients in the diet; ghee (cow) was selected as an inexpensive and rich source of fat, and fish (rohu, river) was selected to be an inexpensive and rich source of vitamin B12 and calcium (Table 3.2.2).

Table 3.2.2: Tank agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	71	3.3	2 727	2.3	4.4	4.1	1.1	0.0	0.0	7.9	4.0	4.0	6.2	1.9	0.0	1.4	4.6	5.3
Baking powder	7	0.3	5 961	5.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.1	0.0	0.0
Breastmilk	194	9.0	0	0.0	2.3	1.1	5.6	4.4	6.7	0.9	2.3	0.8	0.4	1.5	3.4	2.1	0.0	0.6
Milk, goat	161	7.5	11 261	9.7	2.0	2.9	4.9	2.3	1.7	1.8	4.8	1.5	1.6	0.1	26.6	9.4	0.9	1.2
Cookies (bakery)	3	0.1	560	0.5	0.3	0.1	0.5	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.6	0.0
Egg, chicken, domestic, cooked	4	0.2	1 079	0.9	0.1	0.3	0.4	0.5	0.0	0.2	0.5	0.2	0.1	0.2	2.1	0.1	0.5	0.2
Ghee, cow	83	3.9	13 540	11.6	13.9	0.0	61.1	24.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.1	0.0
Sorghum, raw	70	3.3	2 502	2.1	4.6	3.7	1.7	0.0	0.0	3.4	3.0	1.9	3.8	1.3	0.0	0.7	5.3	2.8
Salt	2	0.1	21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millet, pearl, local	269	12.5	11 495	9.9	18.1	16.2	9.9	1.2	0.0	16.0	20.7	13.6	16.8	7.8	0.0	4.4	28.2	20.8
Egg, chicken, farmed, raw	3	0.1	767	0.7	0.1	0.2	0.2	0.2	0.0	0.1	0.4	0.1	0.1	0.1	1.4	0.0	0.3	0.2
Spinach, raw	362	16.9	14 315	12.3	1.8	5.6	1.3	67.1	65.8	2.5	10.9	4.6	15.2	64.0	0.0	12.5	10.7	8.1
Guava, green	13	0.6	1 617	1.4	0.2	0.1	0.0	0.2	25.9	0.6	0.4	0.1	0.3	0.6	0.0	0.1	0.1	0.1
Fish, rohu, river, raw	107	5.0	24 629	21.1	1.8	9.2	2.1	0.0	0.0	1.2	2.5	5.8	2.6	0.0	66.3	26.8	7.0	3.0
Wheat, local or hyw	796	37.1	26 211	22.5	50.2	56.4	11.1	0.0	0.0	65.3	50.4	67.3	53.0	22.4	0.0	10.4	40.7	57.6
Total	2 147	100	116 687	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	225	100	146	105	160	107	308	145	118	100	100	107	246

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in the Tank agriculture livelihood zone are indicated in Annex 3.4-2. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12 and calcium are met only to about 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 3.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Tank but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 504.02–527.34 PKR per day. As with the NUT diet, lactating mothers are the most expensive family members, requiring nearly twice the amount of money their husbands need to meet nutritional needs (Annex 3.5-2).

Table 3.2.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Tank district's agriculture livelihood zone.

Twenty-three of the 111 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat flour (brown) and wheat (local or hyv) are important sources of protein, energy, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc and provide most of these nutrients. Spinach is an important source of vitamin A, vitamin C and folic acid; dairy products i.e. goat milk is an important source of vitamin B12 and calcium, and cow ghee is an important source of fat.

Table 3.2.3: Tank agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	326	10.6	12 543	6.7	20.3	17.6	5.0	0.0	0.0	35.2	14.5	22.5	24.4	5.0	0.0	6.6	21.1	25.4
Wheat, flour, white	201	6.5	7 339	3.9	13.0	10.2	2.4	0.0	0.0	5.7	2.8	8.9	3.7	2.1	0.0	1.0	10.1	8.0
Breastmilk	194	6.3	0	0.0	2.3	1.0	5.6	2.8	4.3	0.9	1.8	0.9	0.3	0.9	2.4	2.1	0.0	0.6
Milk, goat	550	17.9	38 504	20.6	7.0	9.3	16.7	5.1	3.6	5.9	12.8	6.2	4.6	0.3	62.9	32.3	3.0	4.3
Sugar, white	39	1.3	2 256	1.2	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1
Bengal gram, whole, dried, raw	66	2.2	10 908	5.8	4.3	6.5	2.9	0.1	0.0	4.4	4.6	3.6	6.5	6.6	0.0	5.2	7.7	4.6
Cookies (bakery)	18	0.6	3 152	1.7	1.6	0.4	2.8	0.1	0.0	0.2	0.2	0.4	0.2	0.1	0.2	0.1	3.3	0.2
Egg, chicken, domestic, cooked	42	1.4	12 198	6.5	1.4	3.0	4.1	2.8	0.0	1.6	4.0	1.9	1.0	1.0	13.7	1.1	5.3	2.4
Okra, raw	139	4.5	6 824	3.6	1.0	1.4	0.2	0.8	13.4	1.2	5.8	2.2	5.5	4.4	0.0	5.0	1.6	1.2
Ghee, cow	51	1.7	8 303	4.4	8.5	0.0	37.4	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0
Milk, cow, whole fat, pasteurized, UHT	8	0.2	678	0.4	0.1	0.1	0.2	0.1	0.1	0.1	0.5	0.1	0.1	0.0	0.9	0.3	0.0	0.1
Turneric, dried	1	0.0	1 031	0.6	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.1	0.5	0.1
Horseradish	110	3.6	5 390	2.9	0.7	1.0	0.2	1.1	6.1	1.7	2.9	1.1	1.2	1.9	0.0	2.0	1.9	1.1
Cumin, seeds	1	0.0	1 725	0.9	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.5	0.7	0.1
Grass pea, split dried, raw	79	2.6	5 088	2.7	5.2	10.8	0.5	0.1	0.0	6.5	4.3	2.6	5.1	8.7	0.0	1.9	5.6	6.9
Salt	3	0.1	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fennel, seeds	1	0.0	1 072	0.6	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.2	0.1
Milk, buffalo	268	8.7	24 797	13.2	4.9	5.3	13.2	4.8	1.5	3.0	11.9	3.2	2.5	0.9	15.5	15.4	0.0	3.5
Egg, chicken, farmed, raw	14	0.4	3 163	1.7	0.4	0.9	0.9	0.7	0.0	0.6	1.4	0.5	0.4	0.4	4.4	0.0	1.4	0.8
Spinach, raw	590	19.2	23 291	12.4	2.9	8.4	2.1	70.5	68.9	3.9	13.9	9.2	21.1	61.1	0.0	20.4	17.5	13.6
Chilli, red, dry	6	0.2	5 344	2.9	0.4	0.5	0.3	1.4	1.7	1.3	0.7	0.6	2.9	0.4	0.0	0.4	0.2	0.4
Bay leaf, dried	2	0.1	1 603	0.9	0.1	0.1	0.1	0.1	0.4	0.0	0.2	0.1	0.5	0.2	0.0	0.5	0.9	0.2
Wheat, flour, white, refined	24	0.8	945	0.5	1.5	1.1	0.2	0.0	0.0	0.6	0.4	1.0	0.2	0.3	0.0	0.1	0.8	0.9
Wheat, local or hyv	339	11.0	11 159	6.0	21.4	22.2	4.7	0.0	0.0	26.9	16.9	34.8	19.3	5.6	0.0	4.4	17.4	25.4
Total	3 071	100	187 358	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	243	100	226	163	165	136	254	169	201	144	100	106	238

The percentage of target met is an average of the % nutrient requirements met over the year.



In the FHAB diet, the RNI for energy, fat and calcium is only just met for the CoD family in all seasons of the year. The RNI for all other nutrients is comfortably exceeded and there is no nutrient that is difficult to obtain from the foods found locally (Annex 3.6-2).

### 3.2.8 Seasonal fluctuations in the food habits nutritious diet

There is no major seasonal fluctuation in the daily cost of the FHAB diet though it is slightly higher in autumn compared to the other three seasons.

### 3.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Dairy i.e. milk and milk products, followed by staple foods (grain and grain-based products) are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Tank district (Annex 3.7-2). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to its cost while being the least expensive. Households thus rely on these staple foods to provide most of their caloric and nutritional needs. The price of vegetables sharply increases in summer which might result from scarcity during this period.

In the FHAB diet for the child aged 12–23 months, breastmilk makes a significant contribution to fulfilling nutrient requirements, contributing more than one-third (38 per cent) of the total energy needs of the child as well as 68 per cent of fat, 29 per cent of vitamin B2, 43 per cent of vitamin B12, 41 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) and spinach were selected by the software as important sources of iron.

### 3.2.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a nutritious diet. The gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 3.2.4 shows the estimated affordability of the diets per year if the non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor, middle and better-off households while the NUT diet is not affordable only for very poor households.

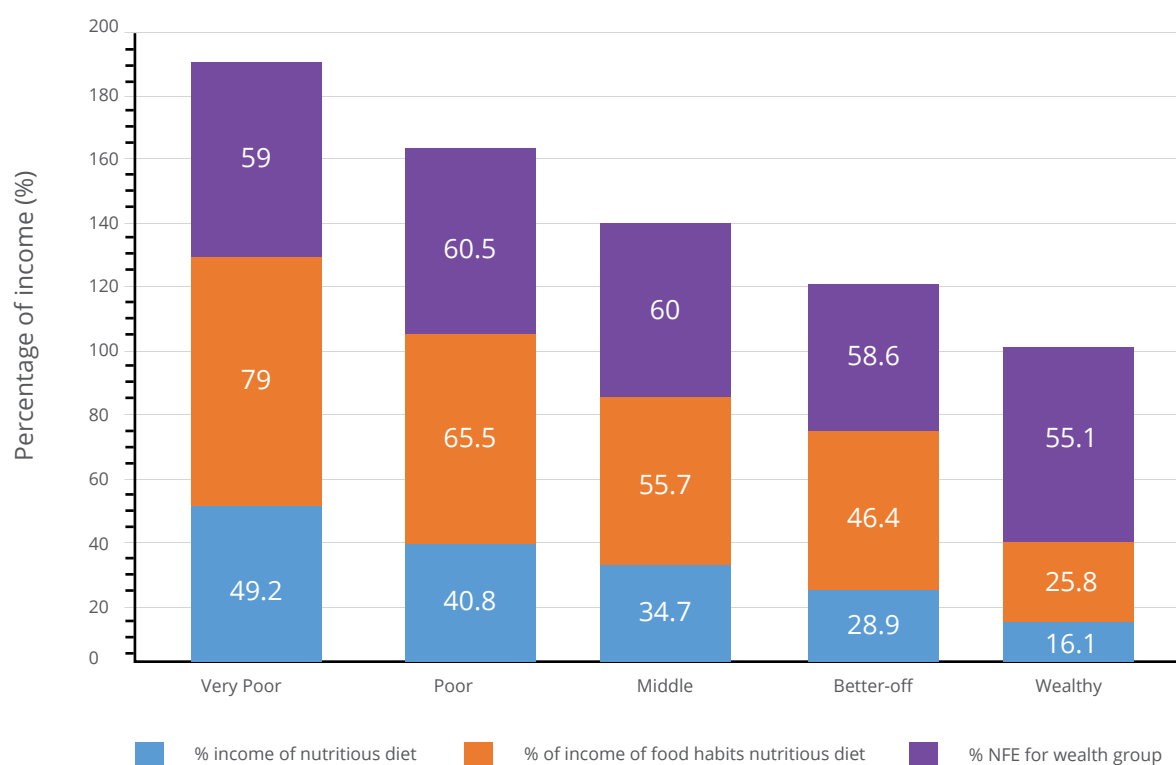
Table 3.2.4: Tank agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non- food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	116,687	49.2	187,358	79	139,830	59.0
Poor	285,912	116,687	40.8	187,358	65.5	172,927	60.5
Middle	336,240	116,687	34.7	187,358	55.7	201,890	60.0
Better-off	404,016	116,687	28.9	187,358	46.4	236,908	58.6
Wealthy	725,412	116,687	16.1	187,358	25.8	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 3.2.1 visually represents the affordability analysis for the five wealth groups in Tank's agriculture livelihood zone based upon the numbers presented in Table 3.2.4 above. The results show that only the wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 38 per cent for very poor, 26 per cent for poor, 16 per cent for middle and 5 per cent for better-off households. The additional amount of money required per year by each group to afford a FHAB diet plus non-food expenditure is 90,284 PKR, 74,373 PKR, 53,008 and 20,250 PKR respectively.

Figure 3.2.1: Tank agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 3.2.11 Modelling nutritional interventions

Four interventions were modelled to examine their effects on the composition and cost of the diet.

#### **Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.**

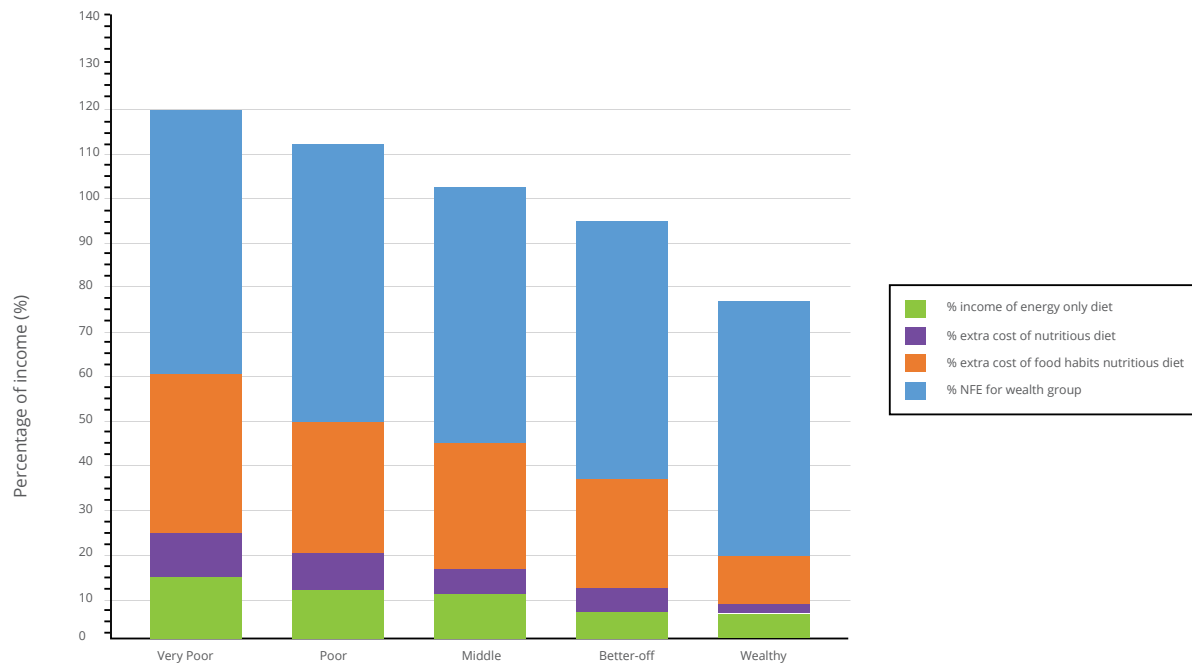
Availability of foods is not a challenge in Tank district's agriculture livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is 38 per cent and 26 per cent of income, respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>3</sup> Activities can be identified through district-specific household economic approach studies.

#### **Model 2. The impact of dairy goat farming on the cost, quality, composition and affordability of a FHAB diet.**

The software identified milk and milk products to be the most expensive food groups in the FHAB diet. This is mostly due to goat milk which accounts for about 21 per cent of the cost of the diet and is identified as an important source of vitamin B12 and calcium. The model promotes rearing of dairy goats to supply households with milk, and brings down the cost of the goat milk to zero to simulate self-production. The model assumes provision of dairy goats and training to households at the initial stage of the programme. Households can consume their produce and sell part of it to generate income. The self-production of goat milk brings down the annual cost of the FHAB diet to 144,800 PKR which remains beyond the reach of the very poor and poor, with gaps of 20 per cent and 11 per cent of annual income respectively. However, the model assumes that this gap could be filled with additional income generated from selling part of the production (Figure 3.2.2).

<sup>3</sup>However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

Figure 3.2.2: Tank agriculture zone: Affordability of EO, NUT and FHAB when dairy goat farming is practised

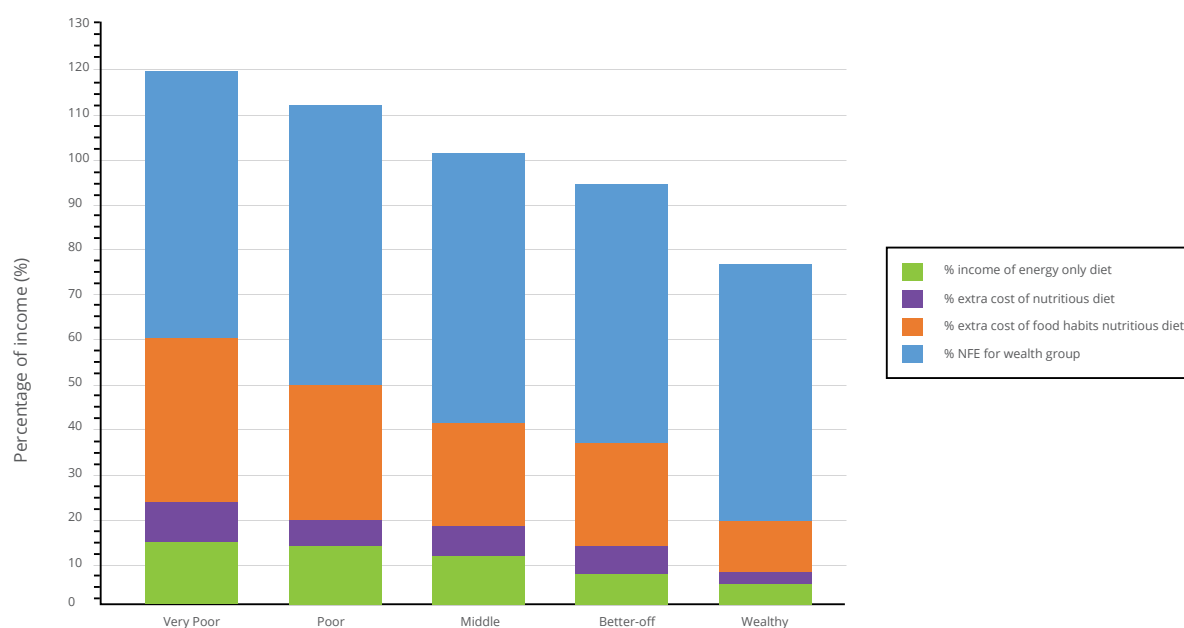


### Model 3. The impact of promoting fish consumption and self-production of wheat (local) on the cost, quality, composition and affordability of a FHAB diet.

Fish (rohu, river, raw) is included in the nutritious diet as an inexpensive and rich source of vitamin B12 and calcium. Its availability and consumption varies among villages and households. This model tests the impact of promoting fish consumption by increasing the minimum and maximum constraints to seven and 14 times a week, respectively. This will allow the software to include fish in the FHAB diet at least once a day. This brings down the cost of the FHAB diet to 170,700 PKR per year. The self-production of wheat (local), as reported by many FGD participants, further brings down the cost of this food to zero. The combined effect (of promoting fish consumption and the self-production of wheat) brings down the cost of the FHAB diet to 141,300 PKR. This narrows the affordability gap to 19 per cent and 10 per cent of annual income for very poor and poor households respectively (Figure 3.2.3).



Figure 3.2.3: Tank agriculture zone: Affordability of EO, NUT and FHAB diets with increased fish consumption and self-production of wheat

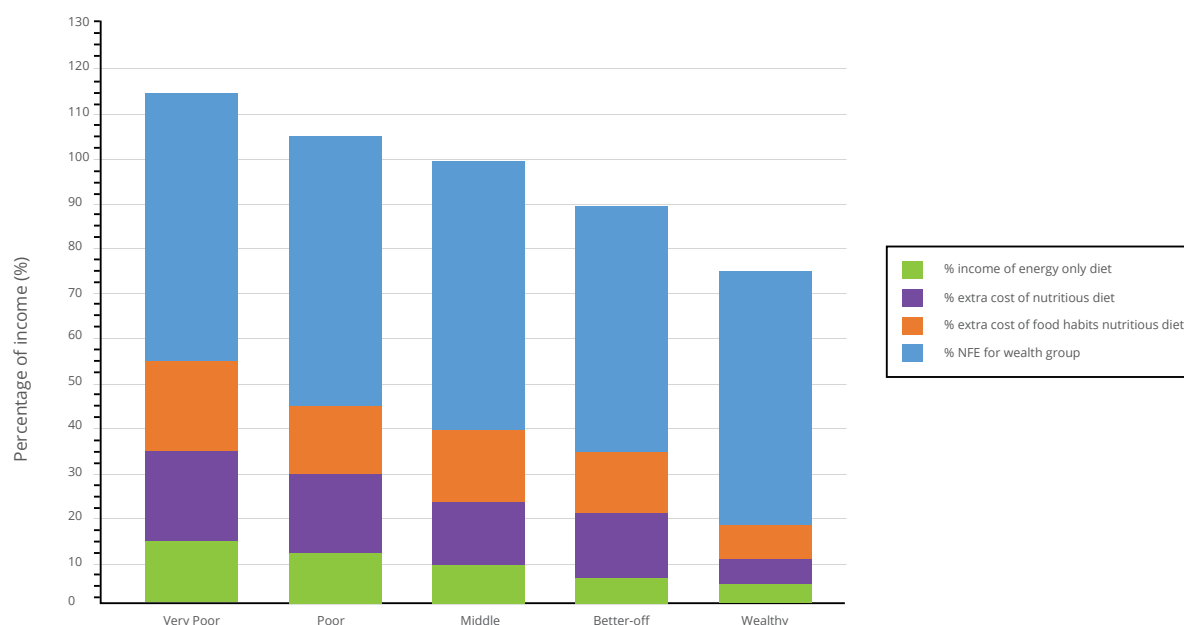


#### Model 4. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 187,400 PKR which is not affordable by very poor, poor, middle and better-off households. When the family size is reduced to five, the cost is significantly reduced, to 139,600 PKR, which is affordable by middle households, and leaving 18 per cent and 9 per cent gaps for the very poor and poor respectively (Figure 3.2.4). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 3.2.4: Tank agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 3.2.12 Key findings

**The FHAB diet is 3.6 times more expensive than a diet that only meets energy requirements.**

The results from the cost of the three diets indicate that the NUT diet is 2.3 times as expensive as the EO diet, meaning that it costs 2.3 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is 3.6 times as expensive as the EO diet and 1.6 times as expensive as NUT diet. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a nutritious diet, wheat (local or hyv), fish (rohu, river, raw) and spinach provide most of the essential micronutrients in the agriculture livelihood zone of Tank district.**

The NUT diet, which does not consider local food habits, is hypothetical but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software includes fish (rohu, river, raw) which is omitted from the FHAB diet. Fish is included as a locally-available inexpensive source of calcium and vitamin B12, contributing most of these nutrients. However, FGD participants said fish is not given to children aged 6–23 months for it is believed to cause abdominal upset.

**Vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software met specifications for vitamin B12 and calcium only by 100 per cent in the NUT diet, showing that these nutrients are the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software identified that the recommended intakes of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. No mineral or vitamin has been met less than 100 per cent using locally-available foods which can be found in almost all the markets that were visited and are therefore considered to be available in the agriculture livelihood zone of Tank district. FGD participants also confirmed availability of a variety of food in the market with limitations due largely to economic capacity and seasonality. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The results from the comparison between total annual household incomes, non-food expenditure and the annual cost of the three diets indicate that very poor, poor, middle and better-off households cannot not afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple foods, the frequency with which foods are eaten, and food taboos and therefore selects foods that are more expensive to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food types such as meat, egg, millet, spinach and cabbage are taboo for breastfeeding mothers. This is because these foods are believed to cause abdominal upset both in mother and baby.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of the child aged 12–23 months.

## **3.2.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements for energy and micronutrients.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding to a child aged 12–23 months.
- Some food taboos were reported, indicating interventions based on food or nutrients alone will be insufficient to ensure a nutritious diet.

## Recommendations

### **Dietary modification is needed to improve quality, composition and affordability of nutritious diets.**

The CoD analysis indicates fish (rohu, river, raw) is a good source of micronutrients such as calcium and vitamin B12 at minimum cost, however it is not frequently consumed and therefore not included in the FHAB diet. Promoting the frequent consumption of fish through social and behavioural change communication strategies is thus necessary. It is also important to bring to the attention of the family the care required by lactating mothers in terms of increased amount, frequency and variety of foods.

### **Promoting dairy goat farming will help improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that promoting dairy goat farming lowers the annual cost of the FHAB making it affordable even by the poor. It also increases income that further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 30 per cent and 25 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or

cash for work programmes for the very poor and poor would allow households to purchase a variety of foods from local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## **3.3 Tank district, livestock/poultry livelihood zone**

### **3.3.1 Market survey to collect price data**

Surveys were conducted in the following six villages: Dabrah, Ghara Baloch, Naurang Luck, Pathan Kot, Ranwal and Rodi Khel. The reference year selected for data collection was 16 March 2017 to 15 March 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 15 March 2018
- Season 2 (Autumn): 1 October 2017 to 15 November 2017
- Season 3 (Summer): 1 May 2017 to 30 September 2017
- Season 4 (Spring): 16 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.3.

### **3.3.2 Availability of foods in the local markets**

The data collection team found 116 foods in the markets of the six villages of the livestock/poultry livelihood zone in Tank district:

- 18 types of grains and grain-based products,
- 5 types of roots and tubers,
- 14 types of legumes, nuts and seeds,
- 2 varieties of meat and offal,
- 2 varieties of fish and seafoods,
- 2 varieties of eggs,
- 5 types of milk and milk products,
- 14 types of vegetables,



- 16 types of fruits,
- 8 types of fats/oils,
- 9 types of sugars and confectionary,
- 18 varieties of herbs, spices and condiments including salt, and
- 3 types of beverages.

### 3.3.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten five or more times a week. Some of the women in the FGDs indicated that they produce wheat in their own farms while others purchase from the market. Rice is also widely consumed in the area. Wheat (whole, brown) and corn are reported to be expensive and not affordable for most of the households, while rice (white) is relatively cheaper and affordable. Most of the women expressed concern about the quality of food products purchased from the market, like milk which was said to be diluted.

The women in the FGDs spoke about dietary habits during pregnancy, breastfeeding, for children aged 6–23 months and people suffering from illness. The women generally said no special foods are prepared for pregnant or breastfeeding mothers. This is because they are poor and cannot afford to eat what they want. Spices and fruits like oranges are believed not to be good during pregnancy. They also said lactating mothers should not consume vegetables like cabbage, spinach and cauliflower, and legumes such as peas, for these are believed to cause abdominal upset in children.

Children aged 6–23 months are mostly fed on potatoes, rice and purchased snacks such as biscuits. Some FGD participants reported vegetables such as cauliflower and cabbage are not good for children and are believed to cause abdominal upset.

People suffering from illness are given soft bread, soup, porridge and custard.

All the FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables. They also reported that self-production of wheat, by those who own land, contributes significantly to their household diet and reduces the need to buy from market. Economic constraints were repeatedly indicated to be the cause for poor household diet. They said they are not receiving any support from the government.

The food taboos described above indicate cost is not the only factor that influences consumption. Although these foods are available in the market, they are not consumed because of local dietary habits.

### 3.3.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are

imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 3.3.1).

Table 3.3.1: Tank livestock/poultry zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	145.91
Macronutrients diet (MAC)	Yes	4	3	162.25
Nutritious diet (NUT)	Yes	12	9	312.01
Food habits nutritious diet (FHAB)	Yes	19	10	412.20

\* Averaged across seasons.

### 3.3.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 144.93 PKR and 146.78 PKR per day and features only two of the 116 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 53,300 PKR (Annex 3.1-3).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key food in the EO diet selected by the software is wheat (white flour or local/hyv).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely solely on this diet for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. RNIs for fat, vitamins including vitamin A, vitamin B2, folic acid, vitamin B12 and vitamin C, and minerals including iron and calcium, are not met by this diet (Annex 3.2-3).

### 3.3.6 Nutritious diet

A NUT diet that meets average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 310.28–320.53 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-3).

The NUT diet includes 11 of the 116 foods known to be eaten by people in the livestock/poultry livelihood zone of Tank district; however, some of these foods would have to be eaten in large quantities, i.e. three times daily, which is impractical. Wheat (local or hyv) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Ghee (cow) was selected as an inexpensive and rich source of fat; goat milk as an inexpensive and rich source of vitamin B12, and baking powder as an inexpensive and rich source of calcium (Table 3.3.2).

Table 3.3.2: Tank livestock/poultry zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	59	2.5	2 255	2.0	3.7	3.5	0.9	0.0	0.0	6.6	3.0	3.6	5.4	1.7	0.0	1.2	4.0	4.7
Baking powder	8	0.3	4 809	4.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.0	0.0	0.0
Breastmilk	194	8.2	0	0.0	2.3	1.1	5.6	5.0	7.0	0.9	2.0	0.8	0.4	1.6	3.4	2.1	0.0	0.6
Milk, goat	572	24.2	38 902	34.2	7.2	10.7	17.4	9.3	6.2	6.3	15.3	5.7	5.9	0.6	94.5	33.2	3.2	4.5
Soybean, dried, raw	32	1.4	3 250	2.9	2.6	5.6	4.8	0.0	0.0	5.4	4.9	2.5	3.0	3.2	0.0	3.0	5.0	4.8
Ghee, cow	61	2.6	9 223	8.1	10.2	0.0	44.9	20.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0
Millet, pearl, flour, local	225	9.5	9 015	7.9	15.1	12.3	7.6	0.0	0.0	10.7	12.2	9.9	11.5	5.6	0.0	2.9	17.3	9.4
Millet, pearl, local	221	9.4	10 454	9.2	14.8	13.5	8.1	1.1	0.0	13.0	15.3	12.1	14.3	7.1	0.0	3.5	24.2	17.9
Egg, chicken, farmed, raw	4	0.2	832	0.7	0.1	0.3	0.3	0.4	0.0	0.2	0.5	0.1	0.1	0.2	2.0	0.0	0.5	0.3
Spinach, raw	303	12.9	10 374	9.1	1.5	4.7	1.1	63.8	57.7	2.1	8.2	4.2	13.2	58.7	0.0	10.4	9.3	7.1
Guava, green	14	0.6	2 252	2.0	0.2	0.1	0.1	0.2	29.1	0.7	0.4	0.2	0.3	0.7	0.0	0.1	0.1	0.1
Wheat, local or hyv	665	28.2	22 518	19.8	42.0	47.9	9.3	0.0	0.0	54.2	38.1	60.8	45.9	20.6	0.0	8.6	35.5	50.5
Total	2 361	100	113 883	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	221	100	128	100	161	118	285	140	108	100	101	102	235

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Tank's livestock/poultry livelihood zone are indicated in Annex 3.4-3. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12, calcium and iron are met only to about 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 3.3.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the livestock/poultry livelihood zone of Tank but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 390.80–444.67 PKR per day. As with the NUT diet, lactating mothers are the most expensive family members (Annex 3.5-3).

Table 3.3.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Tank district's livestock/poultry livelihood zone.

Eighteen of the 116 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat flour (brown) and wheat (local or hyv) are important sources of protein, energy, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provide most of these nutrients. Spinach is an important source of vitamin A, vitamin C and folic acid; dairy products i.e. goat milk is an important source of vitamin B12 and calcium; and cow ghee is an important source of fat.

Table 3.3.3. Tank livestock/poultry zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	325	11.9	12 378	8.2	20.2	17.0	5.0	0.0	0.0	30.2	13.5	21.3	20.9	6.2	0.0	6.5	18.4	24.3
Wheat, flour, white	21	0.8	784	0.5	1.4	1.1	0.3	0.0	0.0	0.5	0.3	0.9	0.3	0.3	0.0	0.1	0.9	0.8
Breastmilk	194	7.1	0	0.0	2.3	0.9	5.6	3.3	4.2	0.8	1.7	0.9	0.3	1.1	2.7	2.1	0.0	0.6
Tea, powder	6	0.2	4857	3.2	0.4	0.6	0.0	0.0	0.0	0.0	1.6	0.7	0.4	0.4	0.0	0.3	0.2	0.3
Milk, goat	618	22.7	42 051	27.9	7.8	10.1	18.7	6.6	4.0	5.8	13.4	6.6	4.5	0.4	81.7	35.8	2.9	4.6
Sugar, white	39	1.4	2 341	1.6	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1
Bengal gram, whole, dried, raw	11	0.4	1 719	1.1	0.7	1.1	0.5	0.0	0.0	0.7	0.7	0.6	1.0	1.4	0.0	0.9	1.2	0.8
Cookies (bakery)	11	0.4	1 701	1.1	0.9	0.2	1.6	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1	1.7	0.1
Egg, chicken, domestic, cooked	17	0.6	4 004	2.7	0.6	1.2	1.7	1.3	0.0	0.6	1.5	0.7	0.4	0.5	6.4	0.4	1.9	0.9
Soybean, dried, raw	126	4.6	12 584	8.4	9.9	19.2	18.5	0.0	0.0	17.5	15.3	10.5	8.3	8.2	0.0	11.5	16.5	17.8
Ghee, cow	41	1.5	6 183	4.1	6.8	0.0	30.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0
Grass pea, split dried, raw	12	0.5	750	0.5	0.8	1.6	0.1	0.0	0.0	0.9	0.6	0.4	0.7	1.7	0.0	0.3	0.8	1.0
Fenugreek, leaf	246	9.0	13 915	9.2	1.7	4.2	0.4	21.6	44.2	4.2	11.4	3.4	21.0	16.7	0.0	19.8	8.8	2.4
Salt	3	0.1	47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millet, pearl, flour, local	286	10.5	11 426	7.6	19.2	13.8	9.7	0.0	0.0	11.4	12.5	13.4	10.4	4.7	0.0	3.7	18.5	11.3
Egg, chicken, farmed, raw	24	0.9	5 199	3.5	0.6	1.6	1.6	1.3	0.0	0.8	2.3	0.9	0.6	0.8	8.9	0.0	2.1	1.4
Spinach, raw	396	14.6	13 878	9.2	1.9	5.4	1.4	55.0	45.8	2.3	8.7	5.9	12.2	50.3	0.0	13.6	10.3	8.8
Chilli, red, dry	6	0.2	5 162	3.4	0.4	0.5	0.3	1.6	1.7	1.1	0.7	0.6	2.5	0.5	0.0	0.4	0.2	0.4
Wheat, local or hyv	339	12.5	11 474	7.6	21.4	21.5	4.7	0.0	0.0	23.2	15.7	33.1	16.6	6.9	0.0	4.4	15.3	24.4
Total	2 722	100	150 453	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	251	100	194	165	192	146	267	197	164	125	101	121	248

The percentage of target met is an average of the % nutrient requirements met over the year.



In the FHAB diet, the RNIs for energy, fat vitamin B12 and calcium are only just met for the CoD family in all seasons of the year. All other nutrients comfortably exceed 100 per cent of RNI and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-3).

### 3.3.8 Seasonal fluctuations in the food habits nutritious diet

The daily cost of the FHAB diet is highest in autumn followed by summer, and falls in winter and spring. This is due to the higher cost of dairy products during the former seasons.

### 3.3.9 The contribution of food groups to the cost of the food habits nutritious diet

Dairy, i.e. milk and milk products, followed by staple foods (grain and grain-based products) are the costliest elements of the FHAB diet for the CoD family in the livestock/poultry livelihood zone of Tank district (Annex 3.7-3). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to its cost while being the least expensive. Households rely on these foods to provide most of their calories and essential nutrients. The price of dairy products sharply increases in autumn which might result from scarcity during this time of year.

In the FHAB diet for the child aged 12–23 months, breastmilk makes a significant contribution to nutrient requirements, contributing more than one-third (38 per cent) of the total energy needs of the child as well as 68 per cent of fat, 38 per cent of vitamin A, 26 per cent of vitamin B2, 19 per cent of niacin, 56 per cent of vitamin B12, 38 per cent of vitamin C, and 30 per cent of calcium needs. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown), soya bean and millet (pearl, local) were selected by the software as important sources of iron.

### 3.3.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 3.3.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households while the NUT diet is not affordable only for very poor households.

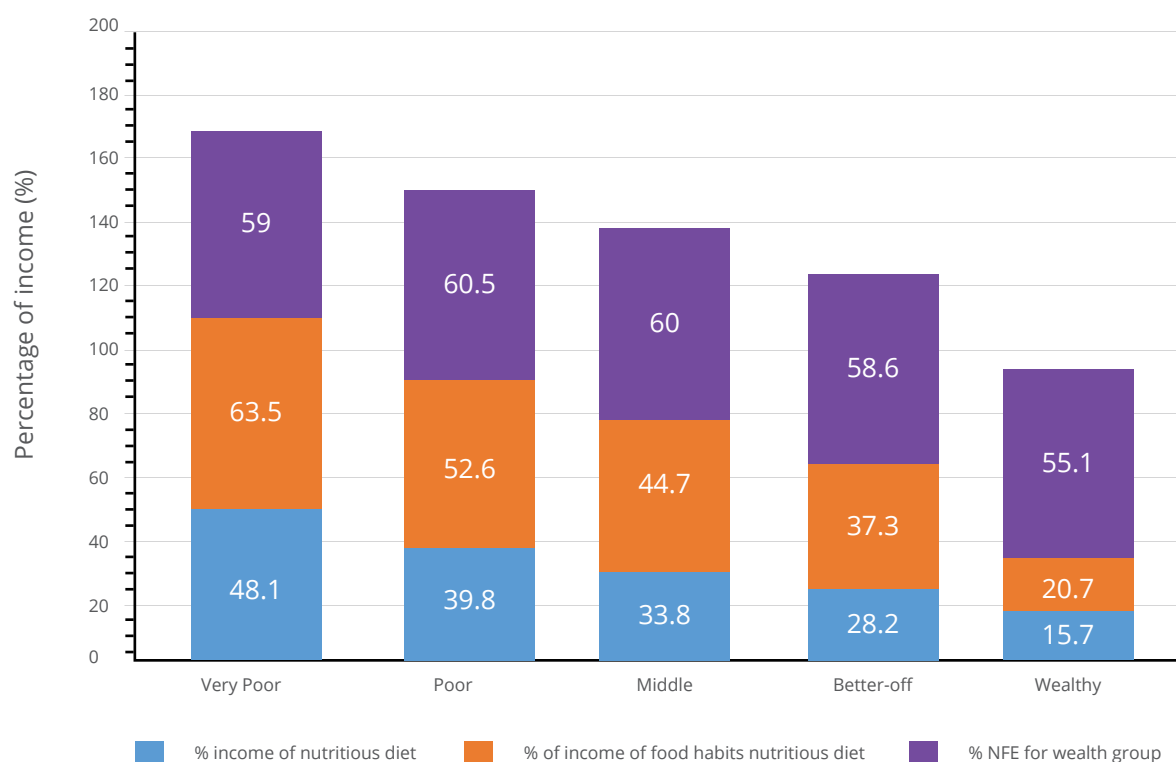
Table 3.3.4: Tank livestock/poultry zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	113,883	48.1	150,453	63.5	139,830	59.0
Poor	285,912	113,883	39.8	150,453	52.6	172,927	60.5
Middle	336,240	113,883	33.8	150,453	44.7	201,890	60.0
Better-off	404,016	113,883	28.2	150,453	37.3	236,908	58.6
Wealthy	725,412	113,883	15.7	150,453	20.7	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 3.3.1 visually represents the affordability analysis for the five wealth groups in Tank's livestock/poultry livelihood zone based upon the numbers presented in Table 3.3.4 above. The results show that wealthy and better-off households can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, very poor, poor and middle households cannot. The affordability gap expressed as a percentage of income is 23 per cent for very poor, 13 per cent for poor, and 5 per cent for middle households. The additional amount required per year by these households to afford a FHAB diet plus non-food expenditure is 53,379 PKR, 37,468 PKR and 16,103 PKR respectively.

Figure 3.3.1: Tank livestock/poultry zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 3.3.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### **Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.**

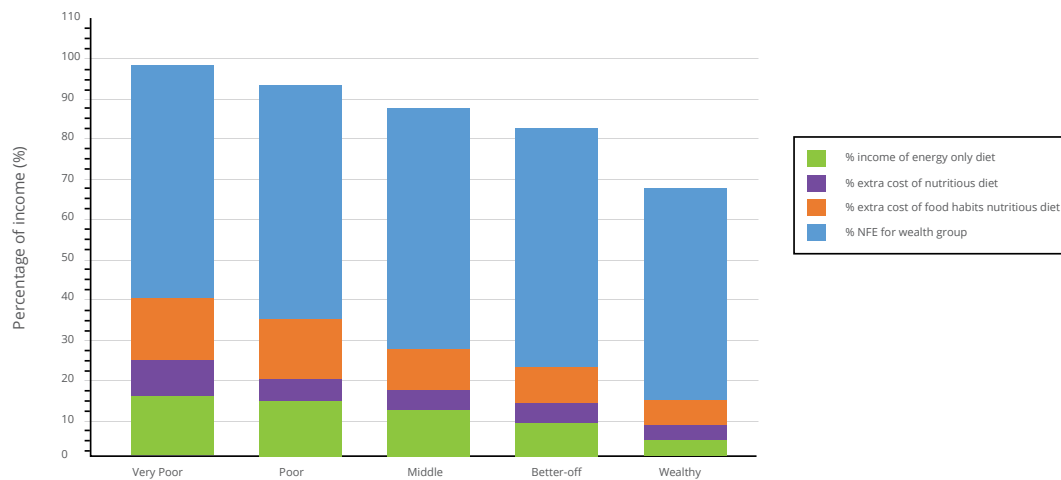
Availability of foods is not a challenge in Tank district's livestock/poultry livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high, and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor, poor and middle households is 23 per cent, 13 per cent and 5 per cent of income, respectively. Thus, current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>4</sup> Activities could be identified through district-specific household economic approach studies.

#### **Model 2. The impact of dairy goat farming on the cost, quality, composition and affordability of a FHAB diet.**

The software identified milk and milk products to be the most expensive of the food groups in the FHAB diet. Most of the cost comes from goat milk which contributes about 28 per cent of the total cost but is identified as an important source of vitamin B12 and calcium, contributing most of these nutrients in the diet. This model brings down the cost of goat milk to zero by simulating self-production. It assumes provision of dairy goats and training to households at the initial stage of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet significantly to 93,400 PKR, making it affordable even for the very poor with some savings (Figure 3.3.2) and room for an additional income stream.

<sup>4</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

Figure 3.3.2: Tank livestock/poultry zone: Affordability of EO, NUT and FHAB diets with dairy goat farming

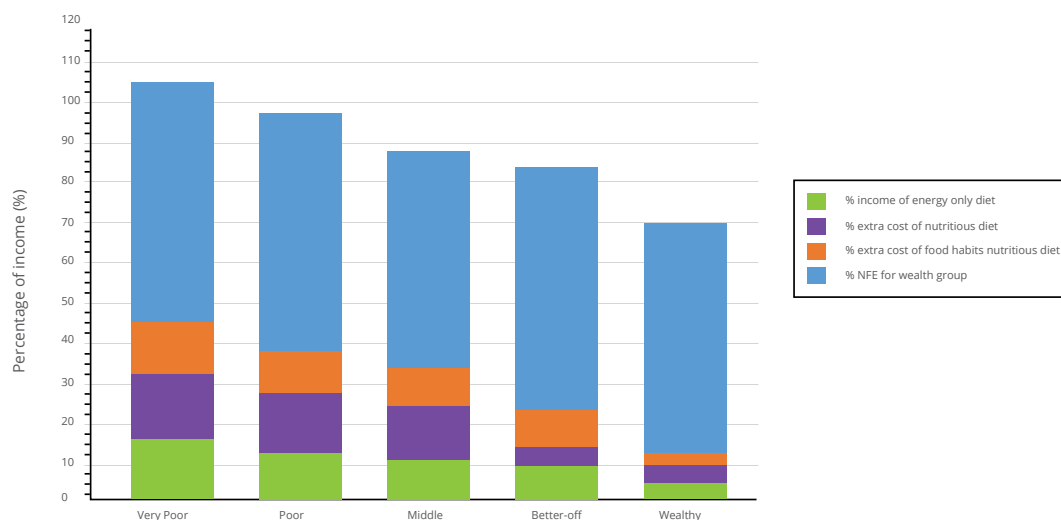


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 150,500 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced to 109,500 PKR, which is affordable for poor and middle households, and leaves only a 5 per cent gap for the very poor (Figure 3.3.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 3.3.3: Tank livestock/poultry zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 3.3.12 Key findings

#### **The FHAB diet is approximately thrice as expensive as a diet that only meets energy requirements.**

The results from the cost of the three diets indicate that the NUT diet, which does not consider food habits, is twice as expensive as the EO diet, meaning that it costs two times as much to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is thrice as expensive as the EO diet and 1.3 times as expensive as the NUT diet which does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

#### **In a NUT diet, goat milk, wheat (local or hyv) and millet provide most of the essential micronutrients in Tank district's livestock/poultry livelihood zone.**

The NUT diet does not consider local food habits and is thus hypothetical but it gives an indication of which foods found on the local market are the least expensive and most nutritious. The software has included wheat (local or hyv), goat milk and millet (pearl, local and pearl flour, local) as both inexpensive and rich source of nutrients. Millet is included as a locally-available inexpensive source of iron, contributing most of this nutrient in the diet. It is also an important source of energy, protein, vitamin B1, vitamin B2, vitamin B6 and zinc. However, FGD participants indicated millet is not frequently consumed.

#### **Vitamin B12, calcium and iron are the hardest nutrients for the software to meet using locally-available foods.**

The software met specifications for vitamin B12, calcium and iron only by 100 per cent in the NUT diet. While the software has found a solution to providing these nutrients, their specification is met only to 100 per cent and they are the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

#### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has identified that the recommended intakes of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. No mineral or vitamin has been met less than 100 per cent of RNI using foods from local markets. The foods selected by the software are to be found in almost all markets visited and are therefore considered to be available in the livestock/poultry livelihood zone of Tank district. FGD participants also confirmed the availability of a variety of foods in the market but are limited by their economic status. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

#### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of the total annual household income, non-food expenditure and annual cost of the three diets shows that very poor, poor and middle households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and selects more expensive foods to comply with local dietary habits.



### Some nutritious foods are taboo for pregnant women and lactating mothers.

Food consumption depends not only on affordability but also on local traditions and culture. Some vegetables such as cabbage, cauliflower and spinach are taboo for breastfeeding mothers as they are believed to cause abdominal upset in children. Oranges and spicy foods are believed to result in abdominal discomfort during pregnancy.

### Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## 3.3.13 Conclusions and recommendations

### Conclusions

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements for energy and micronutrients.
- The analysis shows the importance of breastfeeding with appropriate complementary feeding for children aged 12–23 months.
- Some food taboos were reported, indicating that interventions based on food or nutrients alone will be insufficient.

### Recommendations

#### Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.

The CoD analysis indicates millet (pearl, local and flour, local) are good sources of macro and micronutrients at minimum cost, however, they are not frequently consumed and therefore not included in the FHAB diet. Promoting the consumption of these foods through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family that lactating mothers require additional care by increasing the amount, frequency and variety of foods.

#### Promoting dairy goat farming can help improve quality, composition and affordability of nutritious diets.

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that dairy goat farming lowers the annual cost of the FHAB diet making it affordable even for the very poor. It also increases income and thus further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 23 per cent and 13 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes aimed at the very poor and poor will allow households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.







# **Cost of the Diet Analysis in Islamabad Capital Territory (ICT)**



# 04.

## Cost of the Diet Analysis in Islamabad Capital Territory (ICT)

### 4.1 Islamabad employment/labour (paid/unpaid) livelihood zone

#### 4.1.1 Market survey to collect price data

Surveys were conducted in the following six localities of Islamabad: E-11 Golra, G-12 Mehr Abadi, I-10, Aabpara G-6, H-13 and Shehzad Town. The reference year selected for data collection was 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 November 2017 to 28 February 2018
- Season 2 (Autumn): 16 September 2017 to 31 October 2017
- Season 3 (Summer): 1 May 2017 to 15 September 2017
- Season 4 (Spring): 1 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.4.

#### 4.1.2 Availability of foods in the local markets

The data collection team found 134 foods were available in the markets of the six localities in Islamabad's employment/labour (paid/unpaid) livelihood zone:

- 18 types of grains and grain-based products,
- 8 types of roots and tubers,
- 13 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 4 varieties of fish and sea foods,
- 2 varieties of eggs,
- 6 types of milk and milk products,
- 15 types of vegetables,
- 19 types of fruits,



- 10 types of fats/oils,
- 10 types of sugars and confectionary,
- 17 varieties of herbs, spices and condiments including salt,
- 7 types of beverages, and
- 1 composite dish.

### 4.1.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat in the form of roti is the staple food in the assessment area and is eaten five or more times in a week. Most of the women said white wheat flour (which they referred to as “packed flour”) is good, easily available, affordable and the children like it. Some said wholegrain flour (referred to as “ground flour”) is more nutritious and they like it, however, it is more expensive.

Most women said pregnant women and lactating mothers eat what other family members eat. They added that healthy foods such as fruits, vegetables, milk and chickpeas are good and given to mothers, however some fruits like papaya and oranges should not be given. The influence of mothers-in-law on what is eaten by pregnant and lactating women was also mentioned.

Children aged 6–23 months are mostly fed on milk, Cerelac (infant cereal), fruits such as banana, leafy vegetables and meat, but not beef which is believed to cause allergies.

People suffering from illness are given soft foods, such as sago, cereals and bread, that will not cause abdominal upset.

Nearly all the FGD participants in the six localities acknowledged that a variety of foods are available in the market, however, some of them are not affordable by the very poor and poor. They reported organic foods that are fresh, such as domestic (desi) chicken, eggs and fresh vegetables are now disappearing and are being replaced by artificially made and processed foods.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 4.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 4.1.1).

Table 4.1.1: Islamabad employment/labour (paid/unpaid) zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	171.95
Macronutrients diet (MAC)	Yes	4	3	182.87
Nutritious diet (NUT)	Yes	12	8	352.16
Food habits nutritious diet (FHAB)	Yes	23	10	522.01

\* Averaged across seasons.

### 4.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy need is estimated at 171.44–172.02 PKR per day, and features only two of the 134 foods found in the markets of the six sites excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 62,800 PKR (Annex 3.1-4).

It should be noted that the cost of the diet of a child aged 12–23 months only includes solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day.

The key foods in the EO diet selected by the software are maize (grain or flour local) and millet (pearl, local).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely on it for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. RNIs for vitamins, including vitamins A and C, and minerals, including calcium, are not met by this diet (Annex 3.2-4).

### 4.1.6 Nutritious diet

A NUT diet that meets the average energy requirements and the RNIs for micronutrients is estimated to cost a minimum of 351.30–352.94 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-4).

The NUT diet includes 11 of the 134 foods known to be eaten by people in the employment/labour (paid/unpaid) livelihood zone of Islamabad; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily which is impractical. Millet (pearl, local) was selected by the software as an inexpensive and rich source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Goat milk was selected as an inexpensive and rich source of vitamin B12 and calcium and provides most of these nutrients, while spinach was selected as an inexpensive and rich source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet (Table 4.1.2).

Table 4.1.2: Islamabad employment/labour (paid/unpaid) zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Baking powder	8	0.3	5 881	4.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.5	0.0	0.0
Breastmilk	194	8.2	0	0.0	2.3	1.2	5.6	5.5	7.0	1.0	1.9	1.1	0.4	1.6	3.4	2.1	0.0	0.6
Milk, goat	563	23.8	45 035	35.0	7.1	11.6	17.1	10.1	6.1	6.9	14.3	7.3	5.8	0.5	92.9	33.0	2.3	4.1
Ghee, vegetable	40	1.7	7 179	5.6	6.8	0.0	29.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Ghee, cow	5	0.2	1 083	0.8	0.9	0.0	3.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Cumin, seeds	3	0.1	1 582	1.2	0.2	0.3	0.3	0.1	0.2	0.4	0.3	0.1	0.3	0.0	0.0	1.0	1.1	0.2
Maize, grain or flour, local	37	1.6	1 755	1.4	2.5	1.7	1.0	0.5	0.0	3.6	2.1	2.2	2.5	0.9	0.0	0.1	1.3	1.6
Millet, pearl, local	1023	43.3	42 546	33.1	68.8	69.1	37.7	5.8	0.0	66.8	67.1	72.7	66.5	31.1	0.0	16.6	80.4	76.3
Egg, chicken, farmed, raw	8	0.3	1 693	1.3	0.2	0.6	0.5	0.7	0.0	0.3	0.9	0.3	0.3	0.4	3.6	0.0	0.6	0.4
Spinach, raw	325	13.7	13 393	10.4	1.6	5.6	1.2	75.2	61.8	2.4	8.3	5.9	14.2	59.8	0.0	11.2	7.2	7.0
Guava, green	12	0.5	1 144	0.9	0.1	0.1	0.0	0.2	25.0	0.6	0.3	0.2	0.3	0.6	0.0	0.1	0.1	0.1
Wheat, flour, brown, whole (Wheat, whole, raw)	146	6.2	7 249	5.6	9.3	9.5	3.1	0.0	0.0	17.9	4.8	10.2	9.8	5.2	0.0	2.3	7.0	9.7
Total	2 363	100	128 540	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	200	100	117	100	146	125	219	139	113	100	100	143	256

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for the essential macro and micronutrients by the NUT diet for the typical family in Islamabad are presented in Annex 3.4-4. These show that foods available in local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12 and calcium needs are met only to about 100 per cent, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

#### 4.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the employment/labour (paid/unpaid) livelihood zone of Islamabad but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 519.17–526.18 PKR per day. As with the NUT diet above, lactating mothers are the most expensive family members (Annex 3.5-4).

Table 4.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Islamabad.

Twenty-two of the 134 foods known to be eaten by people in the assessment area are included in the FHAB diet. Among these, wheat flour (whole, brown) and wheat (local or hyv) are important sources of protein, energy, vitamin B1, niacin, vitamin B6, iron and zinc and provide most of these nutrients; egg is an important source of vitamin A, vitamin B2, vitamin B12 and iron; spinach of vitamin A, vitamin C and folic acid; baking powder of calcium; and ghee (vegetable) of fat.

Table 4.1.3: Islamabad employment/labour (paid/unpaid) zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (Kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	77	3.3	4780	2.5	4.8	4.8	1.2	0.0	0.0	6.8	3.9	5.4	6.0	2.0	0.0	1.6	4.8	6.0
Baking powder	14	0.6	11 080	5.8	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.2	0.0	0.0
Breastmilk	194	8.2	0	0.0	2.3	1.1	5.6	5.5	6.9	0.7	2.0	0.9	0.3	1.5	3.0	2.1	0.0	0.6
Tea, powder	6	0.3	5328	2.8	0.4	0.7	0.0	0.0	0.0	0.0	1.9	0.8	0.4	0.6	0.0	0.3	0.2	0.3
Bengal gram, whole, dried, raw	27	1.1	3786	2.0	1.7	3.0	1.2	0.1	0.0	1.4	2.1	1.5	2.7	4.4	0.0	2.1	3.0	1.8
Ghee, vegetable	49	2.1	8668	4.5	8.2	0.0	35.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
Ghee, cow	17	0.7	3560	1.9	2.8	0.0	12.4	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Turmeric, dried	8	0.3	3236	1.7	0.5	0.3	0.5	0.0	0.0	0.1	0.4	0.4	2.7	0.3	0.0	0.5	3.3	0.8
Horseradish	2	0.1	65	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Cumin, seeds	3	0.1	1787	0.9	0.2	0.3	0.4	0.1	0.2	0.3	0.3	0.1	0.2	0.0	0.0	1.1	1.6	0.3
Fenugreek, leaf	1	0.0	53	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Salt	3	0.1	97	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maize, grain or flour, local	336	14.2	16 046	8.4	22.7	15.0	8.9	4.5	0.0	23.6	19.9	17.2	19.1	7.4	0.0	0.8	14.9	15.5
Fennel, seeds	1	0.0	457	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.5	0.2	0.1
Egg, chicken, farmed, raw	235	9.9	52 615	27.6	6.1	18.7	15.6	22.0	0.0	7.8	27.8	9.0	6.7	10.4	96.9	0.0	22.9	14.2
Onion	424	17.9	28 737	15.1	3.5	3.3	0.6	0.0	18.7	3.0	2.5	2.5	10.4	5.6	0.0	3.6	1.1	2.2
Spinach, raw	264	11.1	10 881	5.7	1.3	4.3	0.9	61.2	49.5	1.4	7.0	4.2	9.8	45.2	0.0	9.1	7.5	6.0
Guava, green	12	0.5	1111	0.6	0.1	0.1	0.0	0.2	23.9	0.4	0.3	0.2	0.2	0.5	0.0	0.1	0.1	0.1
Spearmint leaf, raw	2	0.1	854	0.4	0.0	0.0	0.0	0.1	0.4	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.4	0.1
Sesame, seeds, whole, dried	13	0.6	3952	2.1	1.4	1.3	4.5	0.0	0.0	1.9	1.3	1.8	2.0	1.1	0.0	5.0	1.8	2.6
Wheat, flour, white, refined	7	0.3	326	0.2	0.4	0.4	0.0	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.0	0.0	0.2	0.3
Wheat, flour, brown, whole (Wheat, whole, raw)	352	14.9	17 553	9.2	22.6	21.8	7.5	0.1	0.0	31.1	12.0	21.7	20.0	11.8	0.0	5.6	21.8	25.1
Wheat, local or hyv	324	13.7	15 561	8.2	20.5	24.4	4.5	0.0	0.0	21.0	18.2	33.7	19.1	8.9	0.0	4.3	15.9	24.0
Total	2 373	100	190 533	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	212	100	117	101	203	121	251	164	122	114	100	111	240

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy, fat, vitamin C and calcium is only just met for the CoD family in all seasons of the year. All other nutrients exceed 100 per cent of RNI, and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-4).

#### 4.1.8 Seasonal fluctuations in the food habits nutritious diet

There is no seasonal fluctuation in the daily cost of the FHAB diet.

#### 4.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Grain and grain-based products, followed by eggs and vegetables, are the costliest elements of the FHAB diet for a family in Islamabad (Annex 3.7-4). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to its cost while being the least expensive.

In the FHAB diet for children aged 12–23 months, breastmilk makes a significant contribution to nutrient requirements, contributing more than one-third (38 per cent) of the total energy needs of the child as well as 69 per cent of fat, 20 per cent of protein, 56 per cent of vitamin A, 57 per cent of vitamin B12, 62 per cent vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) has been selected by the software as important source of iron.

#### 4.1.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 4.1.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor, middle and better-off households, while the NUT diet is not affordable for the very poor.



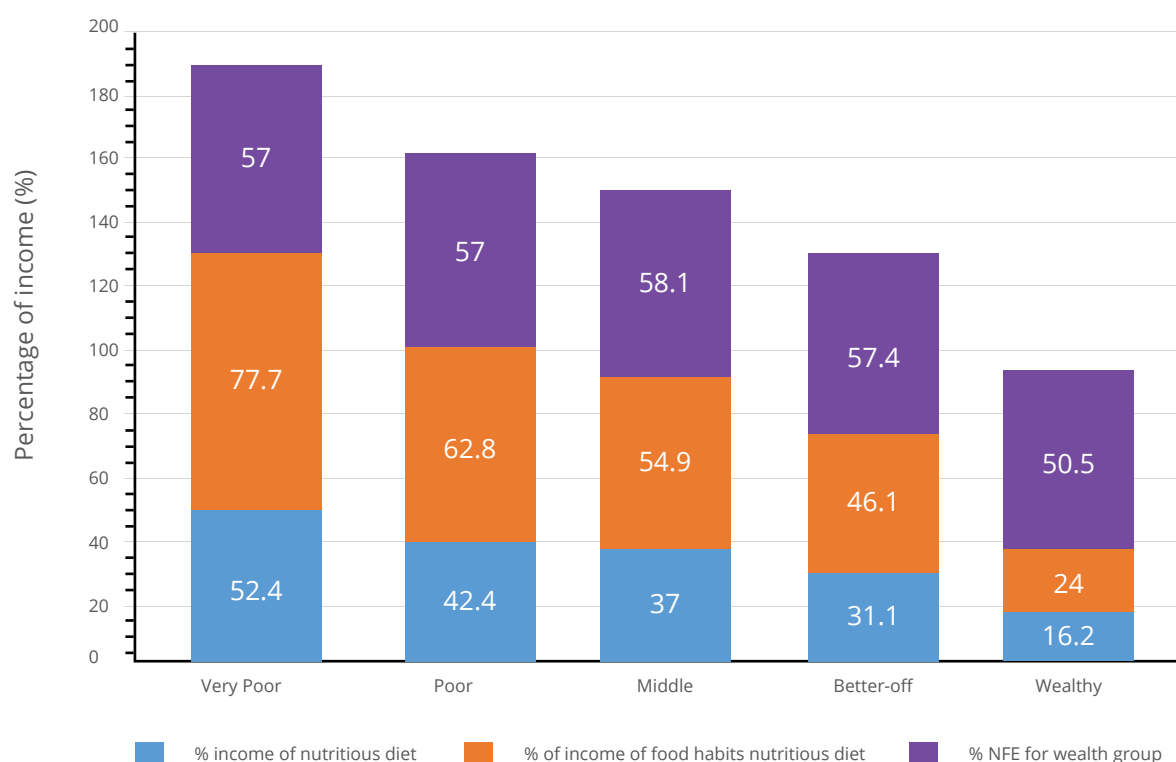
Table 4.1.4: Islamabad employment/labour (paid/unpaid) zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	245,292	128,540	52.4	190,533	77.7	139,830	57
Poor	303,504	128,540	42.4	190,533	62.8	172,927	57
Middle	347,280	128,540	37	190,533	54.9	201,890	58.1
Better-off	412,884	128,540	31.1	190,533	46.1	236,908	57.4
Wealthy	791,400	128,540	16.2	190,533	24	399,977	50.5

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 4.4.1 visually represents the affordability analysis for the five wealth groups in Islamabad's employment/labour (paid/unpaid) livelihood zone based upon the numbers presented in Table 3.4.4 above. The results show that only the wealthy can afford a FHAB plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, all the other wealth groups cannot afford it, with an affordability gap expressed as a percentage of income of 35 per cent for very poor, 20 per cent for poor, 13 per cent for middle households and 4 per cent for better-off households. The additional amount of money required per year by each of these quintiles to afford the FHAB diet plus non-food expenditure is 85,070 PKR, 59,960 PKR, 45,140 PKR and 14,560 PKR respectively.

Figure 4.1.1: Islamabad employment/labour (paid/unpaid) zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



#### 4.1.11 Modelling nutritional interventions

Three interventions were modelled to examine the effects on the composition and cost of the diet.

##### **Model 1. The impact of minimum wage increase, cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.**

Availability of foods is not a challenge in Islamabad's employment/labour (paid/unpaid) livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is 35 per cent and 20 per cent of income, respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. There is a need to review minimum casual labour (skilled/unskilled) wages to increase the income levels of very poor and poor households, many of whom are reliant on source of income. The income gap can also be filled through cash transfers, food vouchers or relevant income-generating activities.<sup>5</sup> The specific activities could be identified through area-specific household economic approach studies.

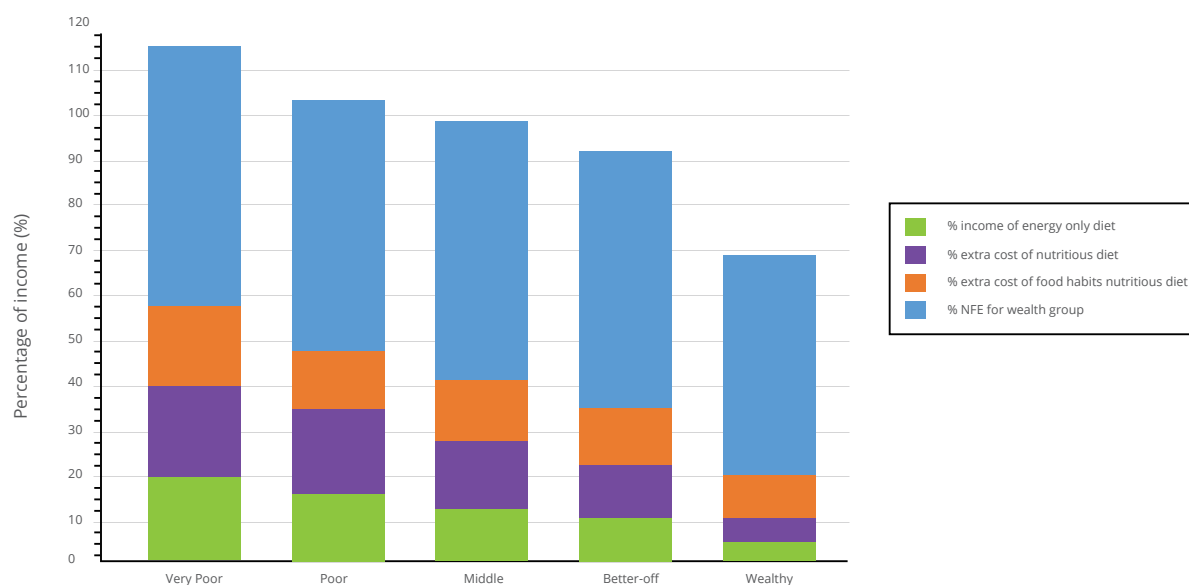
##### **Model 2. The impact of urban vegetable gardening on the cost, quality, composition and affordability of a FHAB diet.**

The software included vegetables and vegetable products in large quantities as important sources of vitamin A, vitamin C and folic acid. These foods, specifically spinach and onion, also contribute significantly to the cost of the FHAB diet following grains and eggs. This model reduces the cost of these two vegetables to zero through self-production in small kitchen gardens or plastic grow-bags. The model assumes provision of inputs such as vegetable seeds and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 142,604 PKR which is still beyond the reach of very poor and poor households, with a gap of 15 per cent and 4 per cent of annual income, respectively. However, the model assumes that this gap could be filled with the additional income generated from the sale of part of the production (Figure 4.1.2).

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<sup>5</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

Figure 4.1.2: Islamabad employment/labour (paid/unpaid) zone: Affordability of EO, NUT and FHAB diets with urban vegetable farming (spinach and onion)

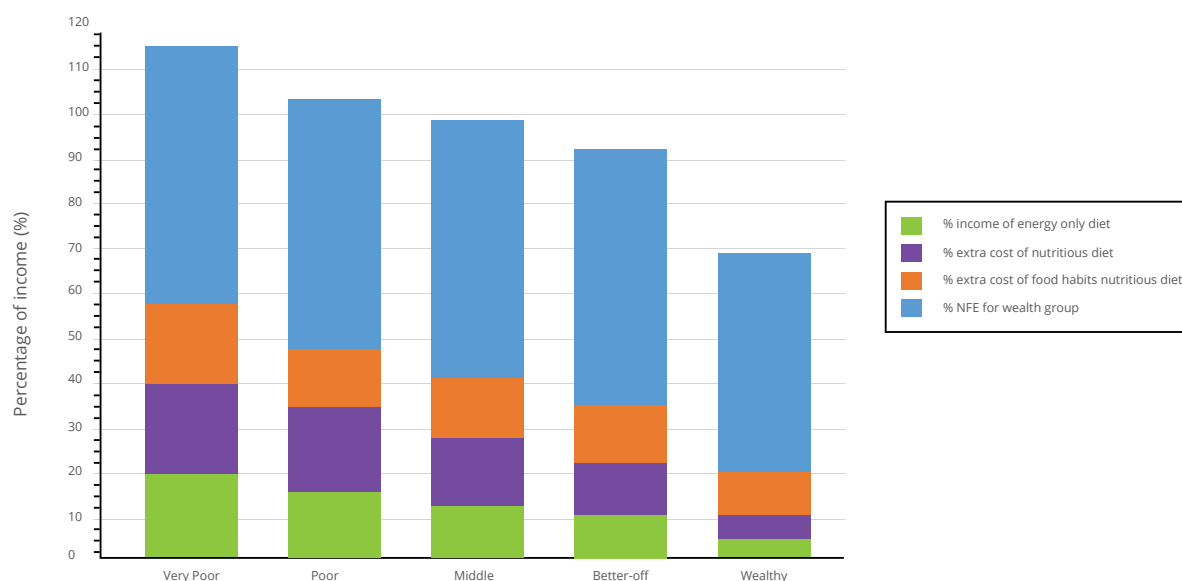


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

The annual cost of the FHAB diet is significantly reduced from the current 190,500 PKR for a family of seven to 139,600 PKR for a family of five, leaving only a 14 per cent and 3 per cent gap for very poor and poor households respectively (Figure 4.1.3). However, a corresponding reduction for non-food expenditure is expected to increase savings which will consequently enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 4.1.3: Islamabad employment/labour (paid/unpaid) livelihood zone: Affordability of EO, NUT and FHAB diets for a household size of five



#### 4.1.12 Key findings

##### The FHAB diet is thrice as expensive than a diet that only meets energy requirements.

The results indicate that the NUT diet is twice as expensive as the EO diet, meaning that it costs double the amount of money needed to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is thrice as expensive as the EO diet and 1.5 times as expensive as the NUT diet, meaning that the constraints applied to reflect typical dietary habits require the software to add more expensive foods to meet the RNIs of the typical CoD family.

##### In a NUT diet, millet and goat milk provide most of the essential micronutrients in Islamabad's employment/labour (paid/unpaid) livelihood zone.

While this is a hypothetical diet it gives an indication of which foods found on the local market are the least expensive and most nutritious. Accordingly, the software has included millet (pearl) and goat milk in the NUT diet in large quantities as locally-available inexpensive sources of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, vitamin B12, iron, calcium and zinc. However, these foods are not included in the FHAB diet as although they are cheap and rich in nutrients, households do not consume these foods as frequently as other foods, and they are not part of local dietary habits. The software, for example, includes 102 kg of millet and 563 kg of goat milk whereas in reality these foods are seldom consumed. Indeed, FGD participants indicated they are not used to eating millet and it is not frequently consumed.

### **Vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software met specifications for vitamin B12 and calcium only by 100 per cent in the NUT diet, however by only just meeting this requirement, these nutrients are shown to be the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software identified that the recommended intakes of energy, protein, fat, all nine vitamins and four minerals can be met using foods available in the local market. No mineral or vitamin has been met at less than 100 per cent RNI using foods from the local markets. The foods selected by the software were all available in almost all the markets visited and are therefore considered to be available in this livelihood zone.

FGD participants also confirmed the availability of a variety of food in the market, and are instead limited by economic capacity. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

A comparison between the annual household income, non-food expenditures and the annual costs of the three diets indicate that only wealthy households in the fifth quintile can afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive to comply with local dietary habits.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months. It contributes 38 per cent of the total energy needs of the child, 69 per cent of fat, 20 per cent of protein, 56 per cent of vitamin A, 57 per cent of vitamin B12, 62 per cent of vitamin C and 30 per cent of calcium.

## **4.1.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and even better-off households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements for energy and micronutrients.

The analysis shows the importance of breastfeeding with appropriate complementary feeding to a child aged 12–23 months.

- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as millet (pearl) and goat milk.

## Recommendations

### **Dietary modification is needed to improve the quality, composition and affordability of nutritious diets.**

The CoD analysis indicates that millet (pearl) and goat milk are locally available and inexpensive foods that are important sources of energy, protein and essential micronutrients. However, these foods are not frequently consumed and therefore not included in the FHAB diet for the Islamabad employment/labour (paid/unpaid) livelihood zone. Stakeholders should advocate for the consumption of these foods to improve the quality of local diets at low cost.

### **Promoting urban agriculture to grow vegetables can help improve the quality, composition and affordability of nutritious diets in this area.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Self-production of vegetables such as spinach and onion which do not require a large space to grow is highly recommended for poorer households. This will lower the annual cost of the FHAB diet and possibly generate additional income.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby promoting child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households



can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 35 per cent and 20 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed social protection interventions through cash transfer or cash for work programmes aimed at the very poor and poor will allow households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.









# Cost of the Diet Analysis in Punjab Province

# 05.

## Cost of the Diet Analysis in Punjab Province

### 5.1 Faisalabad district, agriculture livelihood zone

#### 5.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Awagat, Bhaiwala, Chak Dholanwal, Gallary, Jappal and Lathianwala. The reference year for data collection was 1 March 2017 to 28 February 2018. The team was asked the name and length of each season in reverse order. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 28 February 2018
- Season 2 (Autumn): 16 October 2017 to 15 November 2017
- Season 3 (Summer): 16 April 2017 to 15 April 2017
- Season 4 (Spring): 1 March 2017 to 15 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item, can be found in Annex 1.5.

#### 5.1.2 Availability of foods in the local markets

The data collection team found 95 foods in the markets of the six villages of the agriculture livelihood zone in Faisalabad district:

- 13 types of grains and grain-based products,
- 4 types of roots and tubers,
- 12 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 2 varieties of fish and seafoods,
- 2 varieties of eggs,
- 3 types of milk and milk products,
- 11 types of vegetables,
- 15 types of fruits,
- 3 types of fats/oils,



- 7 types of sugars and confectionary,
- 14 varieties of herbs, spices and condiments including salt, and
- 5 types of beverages.

### 5.1.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten five or more times in a week. Some women stated a preference for brown wholegrain flour (in the form of bread or roti), saying the white flour purchased from the market is full of substances that are dangerous for health and do not have nutritional value. However, others expressed their preference for white flour which they said is cheaper and more widely available, and the bread looks nicer.

The women in the FGDs generally reported that they eat a smaller amount of food up to the fifth month of pregnancy because of the “bad taste” of foods during pregnancy. Beef is not consumed because it is believed to cause constipation, while banana is believed to cause diabetes in pregnancy. Milk and yogurt are believed to facilitate breastmilk production and are consumed by lactating mothers in large quantities. Oranges are said to have a “cold” effect on the baby and is not consumed by lactating mothers. Similarly, corn and guava are believed to cause abdominal pain in the baby and are avoided by lactating mothers.

Children aged 6–23 months are mostly fed cereals, fruits and milk. Mothers also said the children are frequently given biscuits and cakes. Oranges and tamarind are believed to cause sore throat and are not given to children.

People suffering from illness are given soft foods and fluids such as porridge and vermicelli.

Nearly all the FGD participants in the six villages acknowledge that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables. They also reported that household production of buffalo milk contributes significantly to the household diet.

The food taboos described above indicate cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 5.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 5.1.1).

Table 5.1.1: Faisalabad agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	94.32
Macronutrients diet (MAC)	Yes	4	3	130.28
Nutritious diet (NUT)	Yes	14	9	327.11
Food habits nutritious diet (FHAB)	Yes	27	12	460.73

\* Averaged across seasons.

### 5.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 124.21 PKR and 129.79 PKR per day and features only two of the 95 foods found in the markets of the six villages, excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 46,200 PKR (Annex 3.1-5).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the cost of the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day.

The key foods in the EO diet that are selected by the software are maize (grain or flour, local) and millet (pearl, local).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely solely on this diet for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Faisalabad district across all seasons, RNIs for fat, vitamins including vitamin A, vitamin C, pantothenic acid, folic acid and vitamin B12, and minerals including calcium, are not met by this diet (Annex 3.2-5).

### 5.1.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 332.12–334.96 PKR per day, depending on the season. Adolescent children aged 12–13 years, of either sex, are the most expensive family members (Annex 3.3-5).

The NUT diet includes 13 of the 95 foods known to be eaten by people in the agriculture zone of Faisalabad district, however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Millet (pearl, local) was selected by the software as an inexpensive and rich source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet; fish (rohu, river, raw) was selected as an inexpensive and rich source of vitamin B12 and provides most of this nutrient in the diet, and spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet (Table 5.1.2).



Table 5.1.2: Faisalabad agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	320	11.6	11 741	9.6	19.9	18.8	4.9	0.0	0.0	35.6	12.6	22.1	21.1	4.1	0.0	6.5	13.7	20.3
Breadmilk	194	7.0	0	0.0	2.3	1.1	5.6	2.2	3.5	0.9	1.6	0.9	0.3	0.7	3.4	2.1	0.0	0.5
Bengal gram, whole, dried, raw	19	0.7	1 861	1.5	1.2	2.0	0.8	0.0	0.0	1.3	1.1	1.0	1.6	1.5	0.0	1.5	1.4	1.0
Cinnamon, ground	9	0.3	2 547	2.1	0.4	0.2	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.0	3.3	0.6	0.3
Ghee, cow	26	0.9	3 760	3.1	4.3	0.0	19.1	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Milk, cow, whole fat, pasteurized, UHT	262	9.5	19 655	16.2	3.1	4.2	7.2	1.9	2.4	3.7	16.7	2.2	2.3	1.0	43.3	10.4	0.5	2.5
Turmeric, dried	< 1	0.0	143	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.1
Fenugreek, leaf	34	1.2	2 812	2.3	0.2	0.7	0.1	2.1	5.1	0.7	1.5	0.5	3.0	1.6	0.0	2.8	0.9	0.3
Fennel, seeds	15	0.5	3 830	3.1	0.9	1.2	1.6	0.0	0.0	1.4	1.2	1.9	1.1	0.0	0.0	6.9	2.1	1.2
Millet, pearl, local	833	30.2	25 535	21.0	55.9	50.2	30.7	1.9	0.0	49.0	44.2	51.1	39.2	11.7	0.0	13.5	58.2	54.2
Egg, chicken, farmed, raw	4	0.1	697	0.6	0.1	0.3	0.2	0.1	0.0	0.1	0.3	0.1	0.1	0.1	1.7	0.0	0.2	0.2
Spinach, raw	928	33.6	17 709	14.6	4.5	14.3	3.3	87.8	88.8	6.3	19.3	14.5	29.3	79.3	0.0	32.1	18.2	17.4
Fish, rohu, river, raw	83	3.0	26 063	21.4	1.4	7.2	1.6	0.0	0.0	0.9	1.3	5.5	1.5	0.0	51.5	20.9	3.6	2.0
Oil, mustard	34	1.2	5 346	4.4	5.6	0.0	24.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total	2 760	100	121 699	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	224	100	285	199	161	154	254	192	244	100	100	161	292

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in the Faisalabad agriculture livelihood zone are indicated in Annex 3.4-5. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, this diet meets only 100 per cent of RNI of vitamin B12 and calcium, signifying that the software found these nutrients to be hardest to meet using locally-available foods.

### 5.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Faisalabad but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using only foods available in the market but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 493.62–508.07 PKR per day. Unlike the NUT diet, in this case lactating mothers are the most expensive family members (Annex 3.5-5).

Table 3.5.3 shows the absolute weight and cost of foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Faisalabad district's agriculture zone.

Twenty-six of the 95 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software for this diet, wheat flour (brown) is an important source of protein, energy, vitamin B1, niacin, vitamin B6, iron and zinc and provides most of these nutrients. Spinach is an important source of vitamin A, vitamin C, folic acid and calcium; dairy products i.e. whole cow milk are important sources of vitamins B2 and B12; and cow ghee is an important source of fat.

Table 5.1.3: Faisalabad agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	326	9.9	11 964	6.5	20.3	19.3	5.0	0.0	0.0	27.4	11.9	25.1	17.8	4.5	0.0	6.6	18.5	24.6
Breastmilk	194	5.9	0	0.0	2.3	1.1	5.6	2.6	3.1	0.7	1.5	1.0	0.2	0.8	3.3	2.1	0.0	0.6
Tea, powder	6	0.2	4 725	2.6	0.4	0.7	0.0	0.0	0.0	0.0	1.4	0.9	0.3	0.3	0.0	0.3	0.2	0.3
Bengal gram, whole, dried, raw	104	3.2	11 350	6.2	6.8	11.1	4.6	0.1	0.0	5.4	5.9	6.4	7.5	9.3	0.0	8.2	10.7	7.0
Cookies (bakery)	11	0.3	2 510	1.4	0.9	0.3	1.6	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.1	1.7	0.1
Ghee, vegetable	5	0.1	780	0.4	0.8	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cinnamon, ground	6	0.2	1 624	0.9	0.3	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	2.1	0.5	0.3
Ghee, cow	29	0.9	4 219	2.3	4.8	0.0	21.3	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0
Milk, cow, whole fat, pasteurized, UHT	381	11.6	28 584	15.6	4.5	6.2	10.5	3.3	3.0	4.1	22.7	3.6	2.7	1.6	61.1	15.1	0.9	4.3
Beef, mince, lean, raw	< 1	0.0	29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turmeric, dried	8	0.2	1 493	0.8	0.5	0.3	0.5	0.0	0.0	0.1	0.3	0.4	1.9	0.1	0.0	0.5	3.1	0.7
Horseradish	71	2.2	1 795	1.0	0.5	0.7	0.2	0.6	2.8	0.9	1.5	0.8	0.6	1.1	0.0	1.3	1.1	0.7
Cumin, seeds	2	0.1	1 455	0.8	0.2	0.2	0.3	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.9	1.1	0.2
Chilli, green, with seeds, raw	6	0.2	1 050	0.6	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.1	0.3
Grass pea, split dried, raw	24	0.7	1 486	0.8	1.6	3.6	0.2	0.0	0.0	1.5	1.1	0.9	1.1	2.4	0.0	0.6	1.5	2.0
Fenugreek, leaf	232	7.1	19 065	10.4	1.6	4.5	0.3	16.4	30.2	3.6	9.5	3.8	16.8	11.6	0.0	18.9	8.4	2.3
Salt	3	0.1	28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maize, grain or flour, local	251	7.7	8 734	4.8	16.9	10.7	6.7	1.6	0.0	16.8	10.8	14.2	10.1	3.0	0.0	0.6	10.2	11.3
Fennel, seeds	6	0.2	1 669	0.9	0.4	0.5	0.7	0.0	0.0	0.5	0.5	0.9	0.4	0.0	0.0	3.0	1.2	0.6
Milk, buffalo	180	5.5	14 849	8.1	3.3	3.9	8.9	3.0	0.7	1.5	6.6	2.4	1.2	0.5	14.6	10.4	0.0	2.2
Egg, chicken, farmed, raw	45	1.4	9 411	5.1	1.2	3.5	3.0	2.0	0.0	1.4	3.9	1.9	0.9	1.1	20.7	0.0	4.1	2.7
Onion	424	12.9	25 532	13.9	3.5	3.1	0.6	0.0	8.3	2.9	1.8	2.8	7.4	3.0	0.0	3.6	1.0	2.1
Spinach, raw	582	17.8	11 122	6.1	2.8	9.1	2.1	64.9	48.5	3.0	11.3	10.1	15.2	54.1	0.0	20.2	15.2	13.0
Spearmint leaf, raw	< 1	0.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Garlic, raw	6	0.2	1 180	0.6	0.2	0.2	0.0	0.0	0.6	0.1	0.2	0.2	1.1	0.0	0.0	0.1	0.1	0.2
Oil, mustard	23	0.7	3 593	2.0	3.8	0.0	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wheat, flour, brown, whole (Wheat, whole, raw)	352	10.7	15 205	8.3	22.5	20.8	7.5	0.0	0.0	29.6	8.7	23.9	14.2	6.4	0.0	5.6	20.0	24.5
Total	3 279	100	183 517	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	221	100	242	228	212	165	227	232	224	103	100	121	246

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy, fat, vitamin B12 and calcium is only just met for the CoD family in all seasons of the year. The RNI for all other nutrients is comfortably exceeded and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-5).

### 5.1.8 Seasonal fluctuations in the food habits nutritious diet

There are no major seasonal fluctuations in the daily cost of the FHAB diet though it costs slightly less in winter compared to the other three seasons.

### 5.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Vegetables and vegetable products, followed by dairy (milk and milk products) and staple foods (grain and grain-based products) are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Faisalabad district (Annex 3.7-5). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to its cost, though they are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to fulfilling nutrient requirements, providing 38 per cent of total energy needs, 69 per cent of fat, 27 per cent of vitamin B2, 57 per cent of vitamin B12 and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) and spinach were selected by the software as important sources of iron.

### 5.1.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a nutritious diet. The gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 5.1.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households while the NUT diet is not affordable only for very poor households.

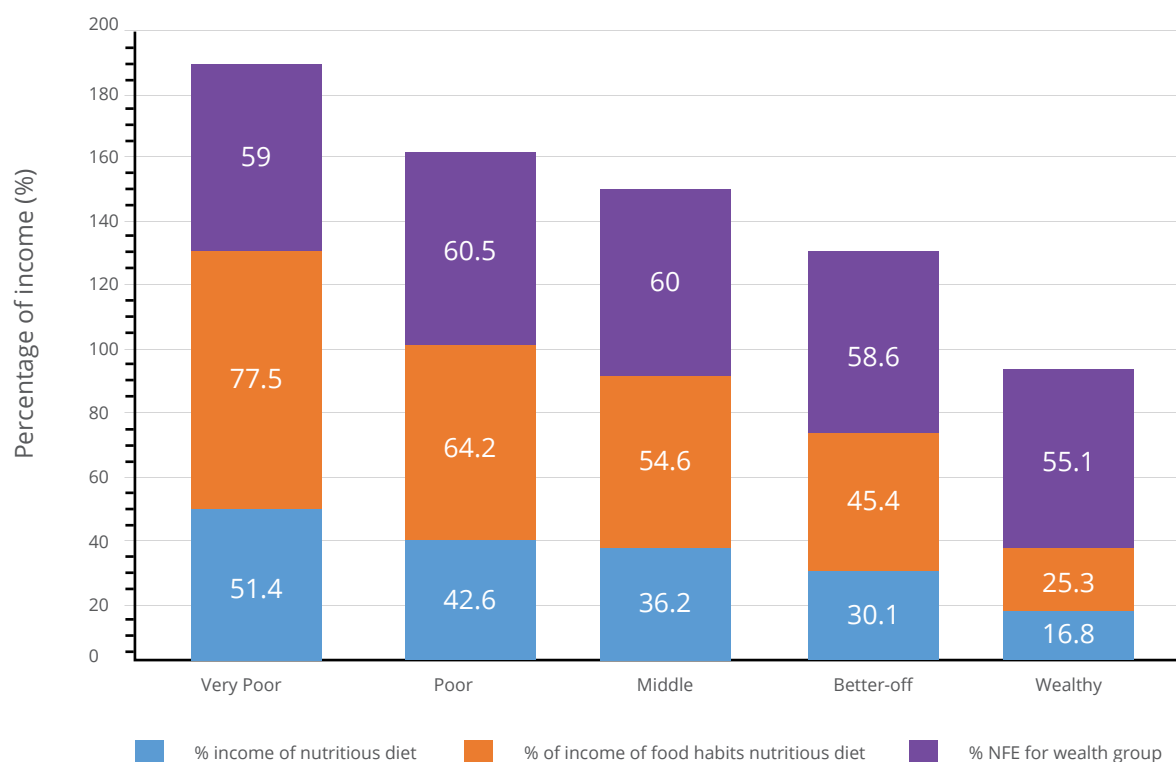
Table 5.1.4: Faisalabad agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	121,699	51.4	183,517	77.5	139,830	59.0
Poor	285,912	121,699	42.6	183,517	64.2	172,927	60.5
Middle	336,240	121,699	36.2	183,517	54.6	201,890	60.0
Better-off	404,016	121,699	30.1	183,517	45.4	236,908	58.6
Wealthy	725,412	121,699	16.8	183,517	25.3	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 5.1.1 visually represents the affordability analysis for the five wealth groups in Faisalabad's agriculture livelihood zone based upon the numbers presented in Table 5.1.4 above. The results show that only the better-off and wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, very poor, poor, middle and better-off households cannot. The affordability gap expressed as a percentage of income is 37 per cent for very poor, 25 per cent for poor, 15 per cent for middle and 4 per cent for better-off households respectively. The additional amount of money these groups require per year is 86,443 PKR, 70,532 PKR, 49,167 PKR and 16,409 PKR, respectively.

Figure 5.1.1: Faisalabad agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income





### 5.1.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### **Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.**

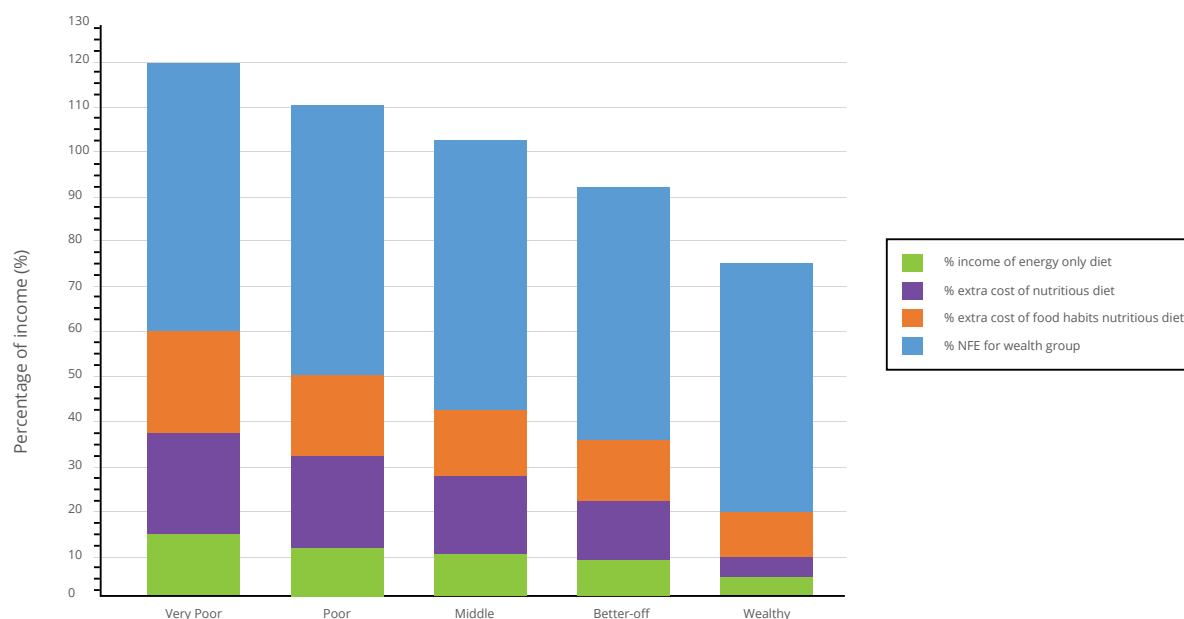
Availability of foods is not a challenge in Faisalabad district's agriculture livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor, poor and middle households is 37 per cent, 25 per cent and 15 per cent of income, respectively. This indicates that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>6</sup> Activities could be identified through district-specific household economic approach studies.

#### **Model 2. The impact of self-production of vegetables in a kitchen garden on the cost, quality, composition and affordability of a FHAB diet.**

The software identified vegetables and vegetable products to be the most expensive of all the food groups in the FHAB diet. Spinach and onions are two of the vegetables included by the software. Spinach is an important source of vitamin A, vitamin C, folic acid and calcium, while onion is added to almost all dishes to add flavour. The model is promoting the cultivation of vegetables in kitchen gardens in the home to bring down the cost of these two key vegetables that are relatively expensive components of the diet, to zero, and thus to simulate self-production at household level. The current model assumes provision of inputs such as vegetable seeds and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 142,141.81 PKR which is still beyond the reach of the very poor and poor as a gap of 19 per cent and 10 per cent of annual income respectively remains. However, the model assumes that this gap could be filled with the additional income generated from the sale of part of the production (Figure 5.1.2).

<sup>6</sup>However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

Figure 5.1.2: Faisalabad agriculture zone: Affordability of EO, NUT and FHAB with self-production of vegetables

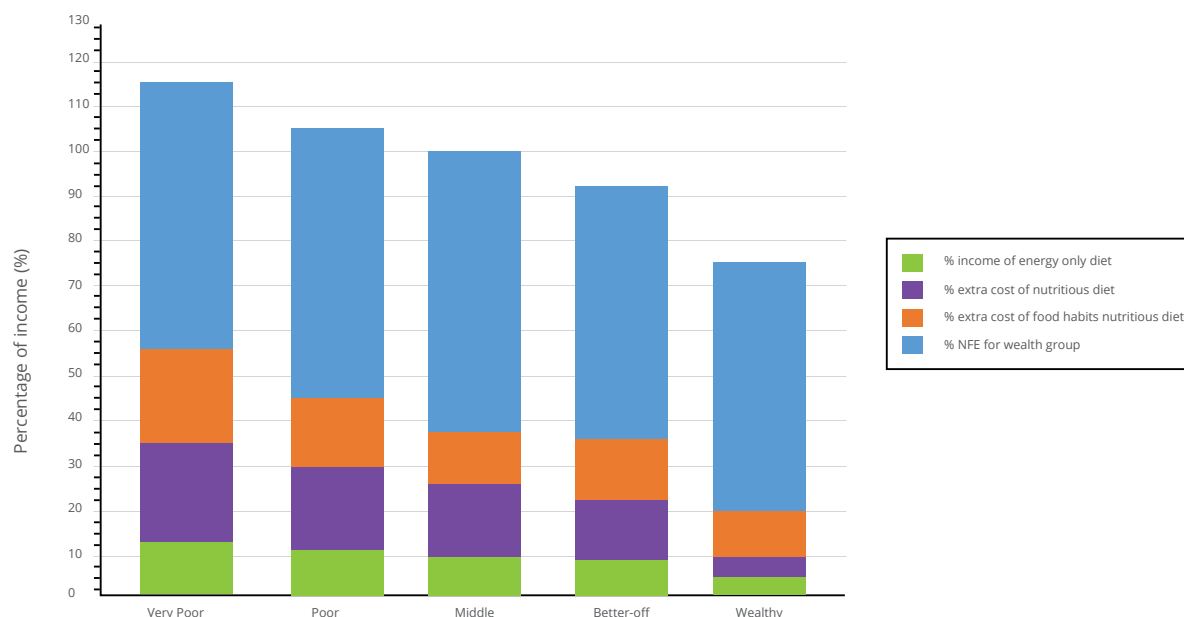


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 183,500 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced to 132,300 PKR, which is affordable by middle households, and leaves only a 15 per cent and 7 per cent gap for the very poor and poor respectively (Figure 5.1.3). However, a corresponding reduction in non-food expenditure also is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 5.1.3: Faisalabad agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 5.1.12 Key findings

**The FHAB diet is approximately four times more expensive than a diet that only meets energy requirements.**

The results indicate that the NUT diet (which does not consider food habits) is 2.6 times as expensive as the EO diet, meaning that it costs 2.6 times as much money to meet protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is four times as expensive as the EO diet and 1.5 times more expensive than the NUT diet. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a nutritious diet, millet (pearl, local) and fish (rohu, river) provide most of the essential micronutrients in the agriculture livelihood zone of Faisalabad district.**

The NUT diet, which does not consider local food habits, is hypothetical but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software includes millet (pearl, local) and fish (rohu, river, raw), both of which are not been included in the FHAB diet. Millet is included as a locally-available inexpensive source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and contributes most of these nutrients to the diet. Fish is included as an important source of vitamin B12 and calcium. However, FGD participants said millet makes a hard bread that is not pleasant to eat and is not frequently consumed.

### **Vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software only reached about 100 per cent of the RNI for vitamin B12 and calcium in the NUT diet. Thus, while the software found a solution, these nutrients whose specification has been met only by 100 per cent are the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has identified that the RNIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the NUT diet are all available in almost all visited markets and are therefore considered to be available in Faisalabad's agriculture livelihood zone. FGD participants also confirmed access to a variety of food in the market that is limited only by their economic capacity. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of total annual household incomes, non-food expenditure and the annual cost of the three diets indicates that very poor, poor, middle and better-off households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. In Faisalabad's agriculture livelihood zone, beef is taboo for pregnant women as it is believed to cause constipation, while banana is believed to result in diabetes in pregnancy. Oranges, corn and guava are believed to cause abdominal pain and discomfort to the baby and are not eaten by lactating mothers.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of the child aged 12–23 months.

### 5.1.13 Conclusions and recommendations

#### Conclusions

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements for energy and micronutrients.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as millet (pearl, local) and fish (rohu, river, raw).

#### Recommendations

##### **Dietary modification is needed to improve quality, composition and affordability of nutritious diets.**

The CoD analysis indicates that millet (pearl, local) and fish (rohu, river, raw) are good sources of macro- and micronutrients at minimum cost, however, these are not frequently consumed and therefore are not included in the FHAB diet. Promoting the frequent consumption of these foods through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care required by lactating mothers in terms of increasing the amount, frequency and variety of foods.

##### **Promoting vegetable production in kitchen gardens can help improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The model promoting self-production of vegetables such as spinach and onion also lowers the annual cost of the FHAB diet making it affordable even for the very poor. It also increases income, further improving affordability.

##### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

## Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

## Social protection schemes should be scaled up to improve affordability of nutritious diets.

The affordability gap for the FHAB diet is 37 per cent of income for very poor and 25 per cent of income for poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes for the very poor and poor will enable households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

## Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

### 5.2 Rajanpur district, agriculture livelihood zone

#### 5.2.1 Market survey to collect price data

Surveys were conducted in the following six villages: Kotla Isaan, Shekarpur, Sahanwala, Kot Mithan, Murghai and Nurpur. The reference year selected for data collection was 16 February 2017 to 15 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 15 February 2018
- Season 2 (Autumn): 16 October 2017 to 15 November 2017
- Season 3 (Summer): 1 May 2017 to 15 October 2017
- Season 4 (Spring): 16 February 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.6.



### 5.2.2 Availability of foods in the local markets

The data collection team found 104 foods in the markets of the six villages of the agriculture livelihood zone in Rajanpur district:

- 14 types of grains and grain-based products,
- 8 types of roots and tubers,
- 10 types of legumes, nuts and seeds,
- 1 variety of meat and offal,
- 2 varieties of fish and seafoods,
- 2 varieties of eggs,
- 4 types of milk and milk products,
- 15 types of vegetables,
- 19 types of fruits,
- 6 types of fats/oils,
- 7 types of sugars and confectionary,
- 14 varieties of herbs, spices and condiments including salt, and
- 2 types of beverages.

### 5.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat (brown, wholegrain) is widely consumed and is the staple food in the assessment area. Millet and corn are said to not be consumed or grown locally. Some participants said they eat maize flour during the months of December and January. Wheat and maize were said to be produced locally.

The consumption of vegetables was reported to vary depending on the season. Cauliflower, carrot, radish and spinach are mostly consumed in winter while bitter melon, pumpkin, bottle gourd and ladyfingers are eaten in summer. Most households said they own cows and cow milk is available and widely consumed in the area. It is said to be cheaper than buffalo milk.

All the women in the FGDs said special foods are not prepared for pregnant and lactating women. Some said pregnant women are given fruit while lactating mothers drink milk, however, both eat what other family members eat and nothing special is prepared. Some food items such as lassi (yogurt drink), kheer (rice pudding) were said to be good and given to lactating mothers. Pulses were reported not to be good for either baby or mother, and are not consumed by pregnant or lactating women. Foods having a “hot” effect on the body are generally avoided by pregnant women. The influence of mothers-in-law was noted in deciding what pregnant women and lactating mothers ought to consume.

Children aged 6–23 months are mostly fed on soft foods such as boiled potatoes, sago, bread soaked in gravy, and milk. Some women said nothing special is fed to the children after the first year. However it was said vegetables such as cauliflower and pulses are not to be given to children.

People suffering from illness are given soft foods such as broth (from animal bones), khichri (rice with meat and lentils), boiled rice, and bhatt (a mixture of milk and rice) while spicy foods are avoided as they are said to aggravate illness.

All the FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables, and some are costly. The participants were from a farming community and said they get grains such as wheat from their own farms and mill it at home.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 5.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 5.2.1).

Table 5.2.1: Rajanpur agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	2	2	76.14
Macronutrients diet (MAC)	Yes	4	4	112.56
Nutritious diet (NUT)	Yes	12	9	318.56
Food habits nutritious diet (FHAB)	Yes	20	11	397.06

\* Averaged across seasons.

### 5.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 70.55 PKR and 83.76 PKR per day depending on the season. It features just one of the 104 foods found in the markets of the six villages, excluding breastmilk. The annual cost of this diet for a typical family is estimated to be 27,800 PKR (Annex 3.1-6).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key food in the EO diet selected by the software is sago palm starch.

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely solely on this diet for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the

additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Rajanpur's agriculture livelihood zone, the RNIs for protein, fat, all nine vitamins and four minerals are not met by this diet (Annex 3.2-6).

### 5.2.6 Nutritious diet

A NUT diet that meets average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 316.82–320.21 PKR per day, depending on the season. Lactating mothers are as the most expensive family members (Annex 3.3-6).

The NUT diet includes 11 of the 104 foods known to be eaten by people in the agriculture zone of Rajanpur district, however, some of these foods would have to be eaten in large quantities, i.e. three times daily, which is impractical given existing dietary patterns. Millet (pearl, local) was selected by the software as an inexpensive and rich source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet; fenugreek (leaf) was selected as a source of vitamin A, vitamin C, folic acid and calcium and provides most of these nutrients in the diet; and goat milk was selected as a source of vitamin B12 (Table 5.2.2).

Table 5.2.2: Rajanpur agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	energy	% energy	protein	% protein	fat	% fat	vit A	% vit A	vit C	% vit C	vit B1	% vit B1	vit B2	% vit B2	niacin	% niacin	vit B6	% vit B6	folic acid	% folic acid	vit B12	% vit B12	calcium	% calcium	iron	% iron	zinc	% zinc
Wheat, flour, brown, wholegrain, raw	68	2.4	2 603	2.2	4.2	4.2	4.3	1.0	1.0	0.0	0.0	4.8	3.6	0.0	8.2	2.6	5.4	4.3	1.8	1.5	0.0	1.4	0.0	1.5	3.3	2.1	0.0	3.0	0.0	5.1	5.1	
Breastmilk	194	6.7	0	0.0	2.3	2.3	1.2	5.6	4.8	3.6	4.8	3.6	3.6	1.0	1.5	1.1	0.3	1.5	1.1	0.3	1.5	0.0	1.5	3.3	2.1	0.0	0.6	0.6	0.6	0.6	0.6	
Milk, goat	566	19.6	31 458	27.1	7.2	7.2	11.3	17.2	8.9	3.1	8.9	3.1	3.1	6.9	11.4	7.3	4.1	0.5	89.0	33.2	0.0	33.2	0.0	89.0	33.2	2.1	4.2	2.1	4.2	4.2	4.2	
Egg, chicken, native, cooked	17	0.6	3 539	3.0	0.6	0.6	1.5	1.7	2.0	0.0	2.0	0.0	0.0	0.7	1.4	0.9	0.4	0.7	7.7	0.5	0.5	0.5	0.9	7.7	0.5	1.5	0.9	0.9	0.9	0.9	0.9	
Soybean, dried, raw	< 1	0.0	55	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
Horseradish	400	13.9	6 342	5.5	2.6	4.3	0.9	6.7	18.3	6.9	6.7	18.3	6.9	9.0	4.8	3.8	11.8	42.2	0.0	7.1	0.0	7.1	4.7	4.0	0.0	7.1	4.7	4.0	4.0	4.0	4.0	
Fenugreek, leaf	452	15.7	30 204	26.0	3.1	9.4	0.7	58.3	68.3	58.3	58.3	68.3	10.1	19.4	7.5	38.4	42.2	0.0	36.8	12.7	4.5	4.5	4.5	4.5	4.5	12.7	4.5	4.5	4.5	4.5	4.5	
Salt	2	0.1	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Millet, pearl, local	1020	35.4	33 960	29.2	68.5	66.7	37.6	37.6	5.1	0.0	65.6	53.1	71.8	46.6	29.3	0.0	16.5	74.2	78.9	78.9	78.9	78.9	78.9	78.9	78.9	74.2	78.9	78.9	78.9	78.9	78.9	
Spinach, raw	70	2.4	3 080	2.6	0.3	1.2	0.3	14.2	6.8	0.5	1.4	1.3	2.1	12.2	0.0	2.4	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.4	1.4	1.6	1.6	1.6	1.6	1.6	
Sago palm, starch	44	1.5	873	0.8	3.1	0.1	0.0	35.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.1	
Oil, sesame	48	1.7	4 143	3.6	8.0	0.0	35.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	2 880	100	116 273	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	100	206	100	100	100	133	196	148	157	221	198	105	100	100	100	100	100	100	100	100	100	154	246	246	246	246	246

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for a typical family in Rajanpur's agriculture livelihood zone are given in Annex 3.4-6. These show that foods available in local markets can provide nutrients in sufficient quantities unless restricted by local dietary habits. However, only 100 per cent of RNI for vitamin B12, calcium and pantothenic acid is met, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 5.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Rajanpur but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to purchase the FHAB diet from the market is 395.83–397.99 PKR per day. Lactating mothers are, once again, the most expensive family members (Annex 3.5-6).

Table 5.2.3 shows the absolute weight and cost of foods for the whole year with the percentage contributed by each item in terms of weight, cost, energy, protein and fat; as well as the percentage contribution of each food to meeting the micronutrient needs of a typical family in Rajanpur's agriculture livelihood zone.

Nineteen of the 104 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software are wheat (local or hyv) as an important source of protein, energy, vitamin B1, niacin, iron and zinc; indeed, it provides most of these nutrients. Additionally, fenugreek (leaf) is an important source of vitamin A, vitamin B2, vitamin B6, folic acid, vitamin C and calcium, and ghee (cow) is an important source of fat.

Table 5.2.3: Rajanpur agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	298	9.5	11 472	7.9	18.5	19.5	4.6	0.0	0.0	29.9	10.8	21.3	18.9	6.9	0.0	6.0	20.5	26.1
Breadmilk	194	6.2	0	0.0	2.3	1.2	5.6	3.7	3.1	0.8	1.4	1.0	0.3	1.3	3.4	2.1	0.0	0.7
Tea, powder	6	0.2	4 625	3.2	0.4	0.8	0.0	0.0	0.0	0.0	1.4	0.8	0.4	0.5	0.0	0.3	0.2	0.3
Bengal gram, whole, dried, raw	22	0.7	2 592	1.8	1.4	2.6	1.0	0.0	0.0	1.4	1.2	1.2	1.8	3.3	0.0	1.7	2.7	1.7
Cookies (bakery)	11	0.3	1 860	1.3	0.9	0.3	1.6	0.1	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.1	2.1	0.1
Ghee, vegetable	11	0.3	1 610	1.1	1.8	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Egg, chicken, native, cooked	44	1.4	9 024	6.2	1.5	3.8	4.3	3.8	0.0	1.5	3.3	2.1	0.9	1.6	20.4	1.1	5.8	2.8
Ghee, cow	55	1.8	7 230	5.0	9.2	0.0	40.6	13.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0
Milk, cow, whole fat, pasteurized, UHT	309	9.9	17 425	12.0	3.6	5.5	8.5	3.7	2.4	3.9	18.1	2.7	2.5	2.1	50.6	12.3	0.9	4.0
Turneric, dried	2	0.1	1 189	0.8	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.1	0.0	0.1	0.9	0.2
Horseradish	586	18.7	9 526	6.6	3.8	6.5	1.3	7.5	23.1	8.4	12.5	6.3	5.5	15.5	0.0	10.4	10.7	6.8
Cumin, seeds	1	0.0	868	0.6	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.4	0.7	0.1
Chilli, green, with seeds, raw	6	0.2	1 148	0.8	0.1	0.1	0.0	0.0	2.6	0.0	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.4
Fenugreek, leaf	455	14.5	30 426	21.0	3.1	9.7	0.7	44.9	59.2	8.4	18.3	6.8	38.1	37.8	0.0	37.0	19.8	5.3
Salt	3	0.1	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Milk, buffalo	305	9.8	19 882	13.7	5.6	7.2	15.1	7.1	1.2	3.1	11.0	3.8	2.4	1.5	25.3	17.5	0.0	4.4
Spinach, raw	100	3.2	4 412	3.0	0.5	1.7	0.4	15.6	8.3	0.6	1.9	1.6	3.0	15.5	0.0	3.5	3.1	2.6
Sago palm, starch	190	6.1	3 783	2.6	13.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	0.6
Wheat, flour, brown, whole	104	3.3	3 996	2.8	6.6	6.7	2.2	0.0	0.0	10.4	2.5	6.5	4.8	3.1	0.0	1.6	7.1	8.3
Wheat, local or hyv	425	13.6	13 822	9.5	26.8	33.8	6.0	0.0	0.0	31.3	17.2	45.3	20.5	10.6	0.0	5.6	23.3	35.7
Total	3 128	100	144 926	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	201	100	173	228	179	168	245	200	134	101	100	100	212

The percentage of target met is an average of the % nutrient requirements met over the year.



In the FHAB diet, the RNI is just reached for energy, fat, vitamin B12, calcium and iron. Intake of all other nutrients exceeds 100 per cent of RNI and there is no nutrient that is difficult to obtain from the foods found in local markets of the six villages of Rajanpur's agriculture livelihood zone (Annex 3.6-6).

### 5.2.8 Seasonal fluctuations in the food habits nutritious diet

There is some seasonal variation in the price of foods across all four seasons.

### 5.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Vegetables and vegetable products, and milk and milk products, are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Rajanpur district (Annex 3.7-6). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost of the FHAB diet, yet they are the least expensive. In addition, they are seasonal and the cost differs between winter and the other three seasons.

In the FHAB diet for the child aged 12–23 months, it is important to note the significant contribution of breastmilk to nutrient requirements. It contributes to more than one-third (38 per cent) of total energy needs, as well as 20 per cent of protein, 69 per cent of fat, 43 per cent of vitamin A, 25 per cent of vitamin B2, 57 per cent of vitamin B12, 32 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (brown wholegrain raw) was selected by the software as an important source of iron.

### 5.2.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 5.2.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households while the NUT diet is not affordable only for very poor households.

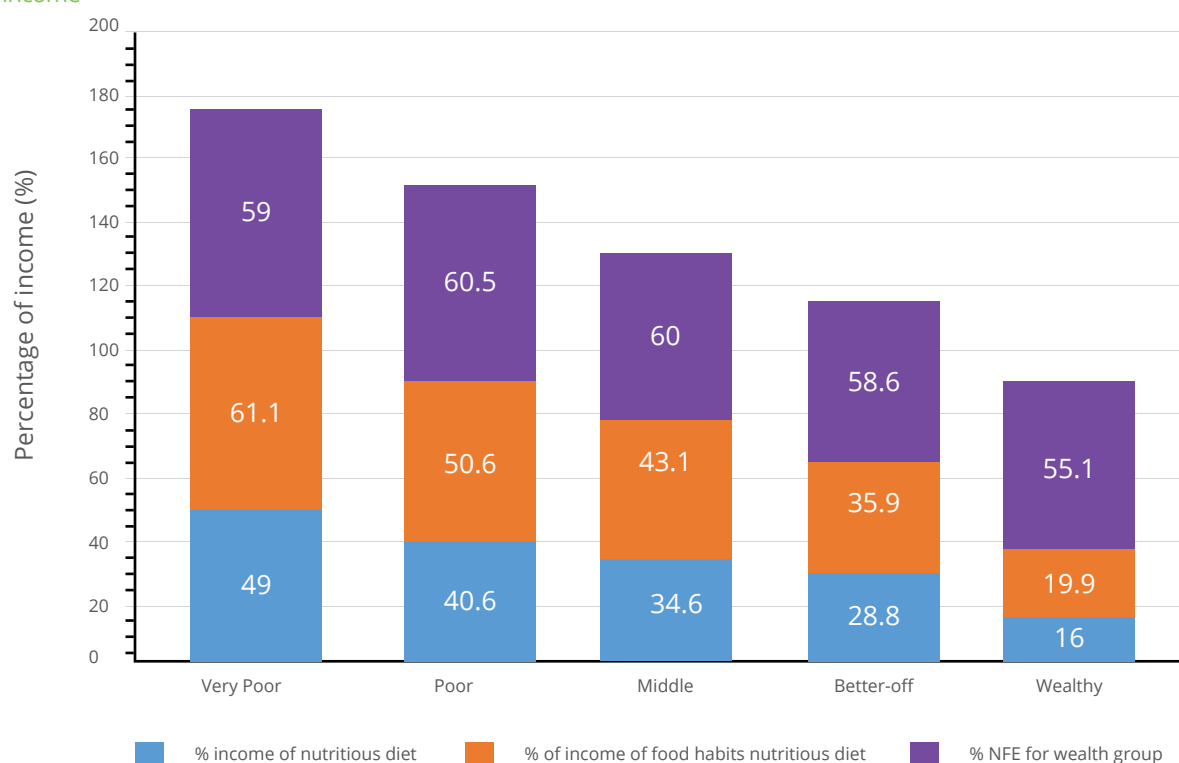
Table 5.2.4: Rajanpur agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	116,273	49	144,926	61.1	139,830	59.0
Poor	285,912	116,273	40.6	144,926	50.6	172,927	60.5
Middle	336,240	116,273	34.6	144,926	43.1	201,890	60.0
Better-off	404,016	116,273	28.8	144,926	35.9	236,908	58.6
Wealthy	725,412	116,273	16	144,926	19.9	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 5.2.1 visually represents the affordability analysis for the five wealth groups in Rajanpur's agriculture livelihood zone based upon the numbers presented in Table 5.2.4 above. The results show that better-off and wealthy households can afford the FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, very poor, poor and middle households cannot. The affordability gap expressed as a percentage of income for very poor, poor and middle wealth groups is 20 per cent, 11 per cent and 3 per cent respectively. The additional amount of money required per year to afford a FHAB diet plus non-food expenditure is 47,852 PKR, 31,941 PKR and 10,576 PKR respectively.

Figure 5.2.1: Rajanpur agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 5.2.11 Modelling nutritional interventions

Four interventions were modelled to examine their effects on the composition and cost of the diet.

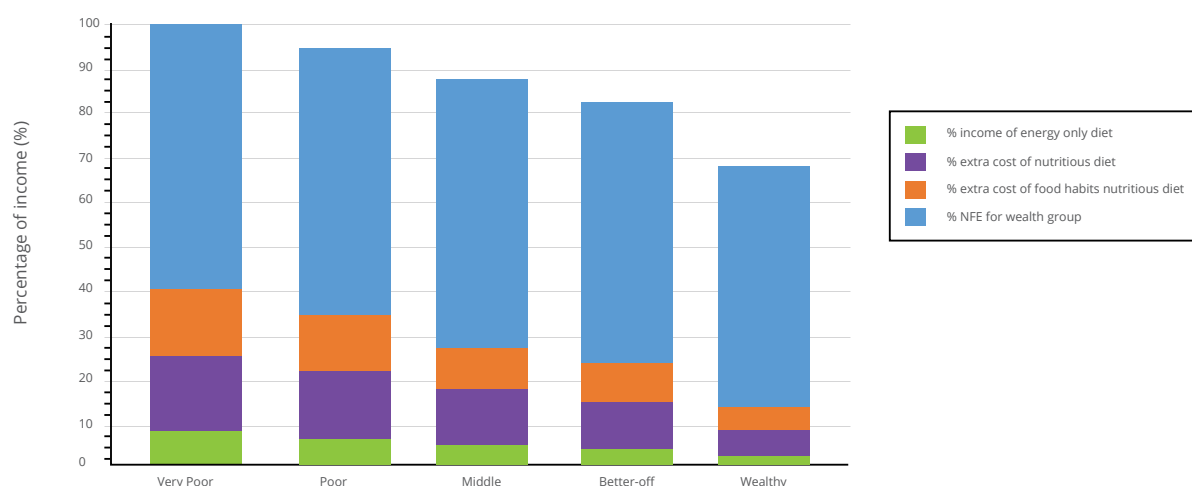
#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Rajanpur district's agriculture livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis finds that the affordability gap for a nutritious diet for very poor and poor households is 20 per cent and 11 per cent of income, respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>7</sup> Activities could be identified through district-specific household economic approach studies.

#### Model 2. The impact of self-production of vegetables on the cost, quality, composition and affordability of a FHAB diet

The software identified vegetables and vegetable products to be the most expensive food groups in the FHAB diet. Fenugreek (leaf) and spinach are the two vegetables included by the software that, together, contribute 24 per cent of the total annual cost of the diet. Fenugreek (leaf) is an important source of vitamin A, vitamin B2, vitamin B6, folic acid, vitamin C and calcium while spinach is an important source of vitamin A and folic. The model brings down their cost to zero by promoting their cultivation in small kitchen gardens. The model assumes provision of inputs such as vegetable seeds and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This brings down the annual cost of the FHAB diet to 94,292 PKR which is affordable even for very poor households with an additional saving of about 1 per cent of their income (Figure 3.6.2).

Figure 5.2.2: Rajanpur agriculture zone: Affordability of EO, NUT and FHAB diets with self-production of vegetables (fenugreek and spinach)

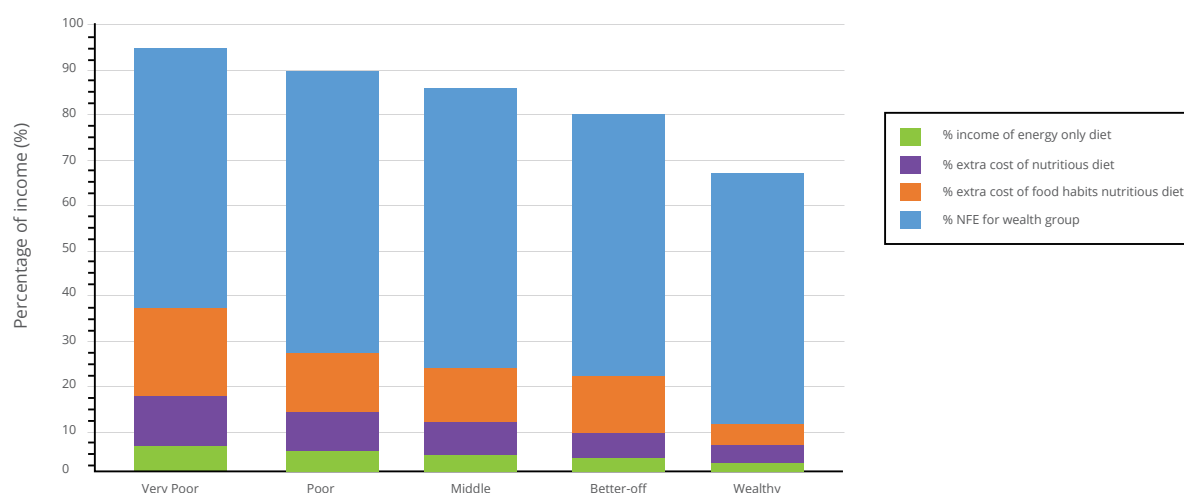


<sup>7</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

### Model 3. The impact of livestock rearing on the cost, quality, composition and affordability of a FHAB diet.

Buffalo and cow milk are widely consumed in the district. FGD participants said some people in the area are rearing their own cows. The software identified both buffalo and cow milk to be an important source of fat, vitamin B12 and calcium. However, these contribute one-fourth (25.7 per cent) of the total cost of the FHAB diet. This model brings down the cost of milk and milk products to zero by promoting rearing of livestock to supply households with milk. The model assumes provision of livestock on a revolving fund basis and with training provided to households at the initial stage of the project. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 84,056 PKR which is affordable even for very poor households who benefit from an additional saving of 5 per cent of income (Figure 5.2.3).

Figure 5.2.3: Rajanpur agriculture zone: Affordability of EO, NUT and FHAB diets with livestock rearing

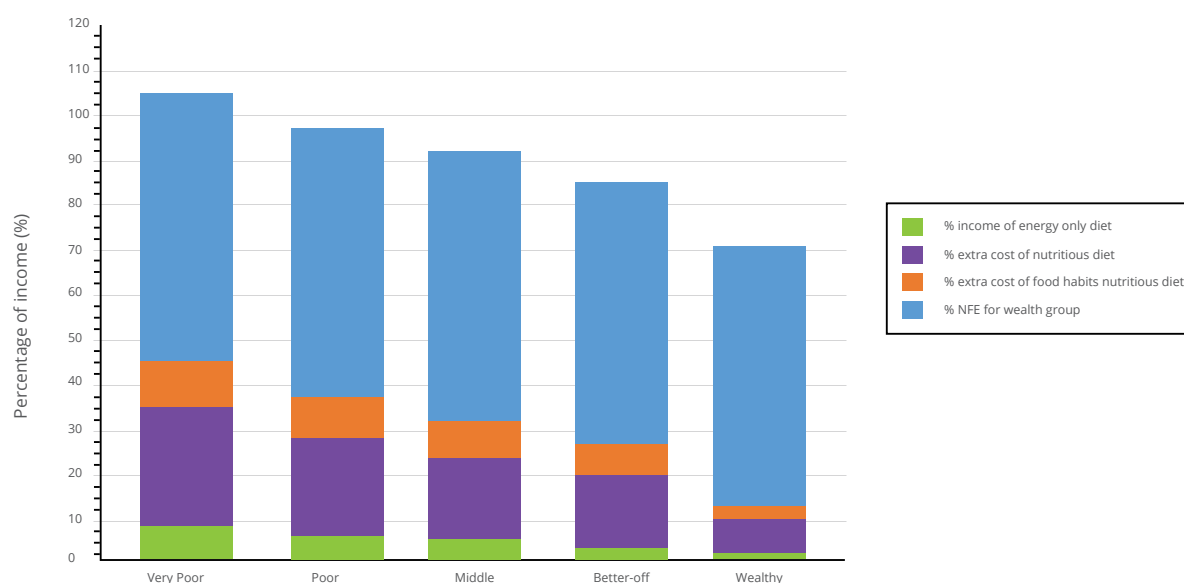


### Model 4. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment finds the annual cost of the FHAB diet for a family of seven to be 161,200 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced to 105,600 PKR, which is affordable for poor and middle households, and leaves only a 4 per cent gap for very poor households (Figure 5.3.4). However, a corresponding reduction in the non-food expenditure is expected which enables even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 5.2.4: Rajanpur agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 5.2.12 Key findings

**The FHAB diet is approximately 5.2 times as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet is 4.2 times as expensive as the EO diet, meaning that it costs 4.2 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is 5.2 times as expensive as the EO diet and 1.2 times as expensive as the NUT diet that does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, millet (pearl, local) provides most of the essential micronutrients in Rajanpur district's agriculture zone.**

The NUT diet does not consider local food habits and is thus hypothetical, but it gives an indication of which foods found on the local market are the least expensive and most nutritious. The software has included millet (pearl, local) as a locally-available and inexpensive source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc. However, this is not included in the FHAB diet and FGD participants said millet is rarely consumed.

**Vitamin B12, calcium and pantothenic acid are the hardest nutrients for the software to meet using locally-available foods.**

The software just met the RNI for vitamin B12, calcium and pantothenic acid in the NUT diet. While the software has found a solution, nutrients which just reach 100 per cent of RNI are the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has shown that the RDIs for energy, protein, fat, all the nine vitamins and four minerals can be fully met using foods available in the local market. The foods selected by the software for the NUT diet are all available in almost all markets visited and are therefore considered to be available in the agriculture livelihood zone of Rajanpur district. FGD participants also confirmed availability of a variety of food in the market, including vegetables, fruits and grains. Some vegetables were described as seasonal and available during summer and others during winter. Most households also keep cows and self-produce milk. This suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of the total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor, poor and middle households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore select foods that are more expensive to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food types such as pulses were reported to be not good for pregnant women and lactating mothers as they are believed to produce gas.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **5.2.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as millet (pearl, local).



## Recommendations

### **Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.**

The CoD analysis indicates millet (pearl, local) is an inexpensive and rich source of energy, protein, fat, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc. This food, however, is not frequently consumed and therefore not included in the FHAB diet. Promoting the frequent consumption of millet through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care lactating mothers require in terms of increasing the amount, frequency and variety of foods.

### **Promoting vegetable production in kitchen gardens can help improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that promoting self-production of vegetables such as fenugreek and spinach lowers the annual cost of the FHAB diet, making it affordable even for the very poor. It also increases income and thus further improves affordability.

### **Promoting livestock rearing helps improve quality, composition and affordability of nutritious diets.**

Self-production of milk (cow and buffalo) at the household level through livestock rearing lowers the annual cost of the FHAB diet making it affordable even for the poor. It also increases incomes and further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. CoD modelling clearly indicates that very poor households are left with an income gap of only 9 per cent to afford a FHAB diet if the family size is limited to five, a gap which may be filled with the corresponding reduction in non-food expenditure. Therefore, meeting the significant unmet need for family planning and

limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

**Social protection schemes should be scaled up to improve affordability of nutritious diets.**

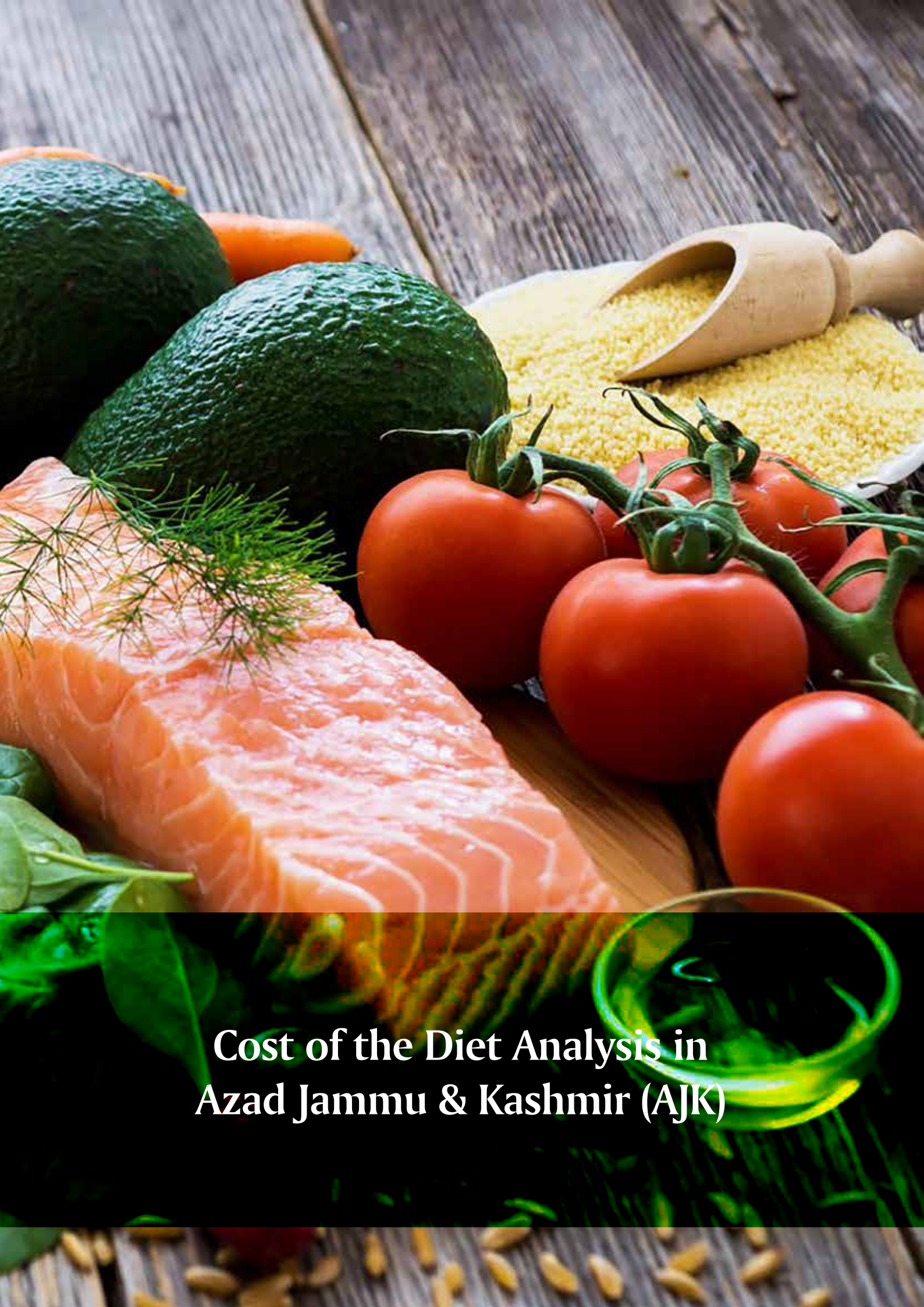
The affordability gap for the FHAB diet is 20 per cent and 11 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes aimed at the very poor and poor will allow households to purchase variety of foods from the local market, enabling them to achieve a nutritious diet.

**Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.







## **Cost of the Diet Analysis in Azad Jammu & Kashmir (AJK)**

# 06.

## Cost of the Diet Analysis in Azad Jammu & Kashmir (AJK)

### 6.1 Haveli district, agriculture livelihood zone

#### 6.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Gugdar, Halan, Khursidabad, Plangi, Raiji and Tungar. The reference year selected for data collection was from 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 28 February 2018
- Season 2 (Autumn): 1 September 2017 to 15 November 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 1 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item, can be found in Annex 1.7.

#### 6.1.2 Availability of foods in the local markets

The data collection team found 82 foods in the markets of the six villages of the agriculture livelihood zone in Haveli district:

- 13 types of grains and grain-based products,
- 3 types of roots and tubers,
- 8 types of legumes, nuts and seeds,
- 3 varieties of meat and offal,
- 2 varieties of eggs,
- 1 type of milk and milk product,
- 11 types of vegetables,
- 12 types of fruits,
- 4 types of fats/oils,
- 5 types of sugars and confectionary,
- 17 varieties of herbs, spices and condiments including salt, and
- 3 types of beverages.

### 6.1.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten daily. Most of the women said white wheat flour is cheaper and better to prepare bread while brown wholegrain wheat flour is generally not available in the area. Most of the women said corn is produced in their own farm and is therefore not purchased from the market.

All the women in the FGDs said no special foods are given to pregnant women or lactating mothers who simply eat what other members of the family eat, as they cannot afford special foods. However, certain foods such as eggs, milk and fruits are said to be good for pregnant women and families give them if they can afford it. Foods that are not too “hot” or too “cold” in effect are also given. Foods with “hot” and “cold” effect are believed to be dangerous for the health of the foetus. These foods are also avoided by breastfeeding mothers for similar reasons, i.e. they are believed to be not good for the health of the baby.

Children aged 6–23 months are mostly fed milk, Cerelac (infant cereal) and other cereals, porridge and fruits such as banana. Cold and hard foods are believed to cause abdominal irritation and therefore not given to them.

People suffering from illness are given soft and light foods such khichri (rice with lentils and meat). These foods are believed to facilitate recovery. Heavy and spicy foods are not given to those suffering from illness.

Nearly all the FGD participants in the six villages acknowledged that a variety of foods are available in the market although some are seasonal, especially fruits and vegetables. Some households reported self-production of corn and some fruits such as apple and pear and do not purchase them from the market.

The food taboos described above indicate that cost is not the only factor influencing consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 6.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 6.1.1).



Table 6.1.1: Haveli agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	156.36
Macronutrients diet (MAC)	Yes	4	3	162.04
Nutritious diet (NUT)	Yes	12	7	469.43
Food habits nutritious diet (FHAB)	Yes	21	10	581.38

\* Averaged across seasons.

### 6.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to be 156.36 PKR per day and does not change across seasons. It features only two of the 82 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 57,100 PKR (Annex 3.1-7).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average energy and nutrients required by the lactating mother each day.

The key foods in the EO diet that are selected by the software are maize (grain or flour local) and maize (yellow dried raw).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote the diet as people reliant on these diets for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, when other diets are calculated. The RNIs for fat, vitamins including vitamin A, vitamin B2, pantothenic acid, folic acid, vitamin B12 and vitamin C, and minerals including calcium and iron, are not met by this diet (Annex 3.2-7).

### 6.1.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 461.78–477.71 PKR per day, depending on the season. Adolescent children aged 12–13 years are the most expensive family members (Annex 3.3-7).

The NUT diet includes 11 of the 82 foods known to be eaten by people in the agriculture zone of Haveli district; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat (brown, wholegrain) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Additionally, ghee (cow) and milk (buffalo) were selected as sources of fat, vitamin B12 and calcium, and egg was selected as a source of vitamin B12 (Table 6.1.2).

Table 6.1.2: Haveli agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (Kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	961	33.0	38 359	22.4	59.8	55.1	14.7	0.1	0.0	77.6	39.2	66.3	55.4	13.5	0.0	19.4	51.6	60.4
Wheat, flour, white	63	2.2	2 643	1.5	4.1	3.4	0.8	0.0	0.0	1.3	0.8	2.8	0.9	0.6	0.0	0.3	2.6	2.0
Maize, yellow, dried, raw	82	2.8	3 044	1.8	5.3	4.1	2.0	0.2	0.0	5.3	2.2	1.8	7.2	0.8	0.0	0.4	2.6	5.6
Breastmilk	194	6.7	0	0.0	2.3	1.0	5.6	2.3	4.0	0.7	1.6	0.9	0.3	0.8	3.4	2.1	0.0	0.5
Ghee, cow	41	1.4	5 171	3.0	6.9	0.0	30.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0
Turmeric, dried	2	0.1	713	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.5	0.0	0.0	0.1	0.7	0.2
Fennel, seeds	14	0.5	6 390	3.7	0.9	1.1	1.5	0.0	0.0	1.0	1.2	1.8	0.9	0.0	0.0	6.6	2.6	1.1
Milk, buffalo	602	20.7	59 454	34.7	11.1	12.6	29.6	8.5	3.1	5.0	24.6	7.1	4.3	1.8	50.3	34.6	0.0	6.3
Egg, chicken, farmed, raw	98	3.4	19 368	11.3	2.5	7.3	6.5	3.8	0.0	3.0	9.5	3.7	2.1	2.4	46.2	0.0	8.3	4.8
Spinach, raw	818	28.0	29 182	17.0	4.0	12.3	2.9	77.6	88.3	4.0	17.7	12.7	22.6	76.9	0.0	28.3	20.1	15.2
Mustard, seeds	19	0.7	2 339	1.4	1.8	2.2	5.0	0.0	0.0	2.1	1.2	1.8	1.1	1.5	0.0	1.9	1.9	2.4
Bay leaf, dried	19	0.7	4 678	2.7	1.3	0.8	1.2	1.4	4.6	0.0	2.0	0.8	4.8	1.7	0.0	6.3	9.2	1.5
Total	2 916	100	171 341	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	229	101	284	176	222	148	254	220	222	100	100	128	295

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in the Haveli agriculture livelihood zone are indicated in Annex 3.4-7. These show that foods available in local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12 and calcium are met only to 100 per cent, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 6.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Haveli but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 568.43–605.43 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-7).

Table 6.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat, and the percentage contribution of each food for to meeting the micronutrient needs of a typical family in Haveli district's agriculture zone.

Twenty of the 82 foods known to be eaten by people in the district are included in the FHAB diet. Among these are maize (yellow dried raw) which forms an important source of protein, energy, vitamin B1, niacin, vitamin B6, iron and zinc and provides most of these nutrients. Additionally, spinach is an important source of vitamin A and folic acid; fenugreek (leaf) is an important source of vitamin C, and dairy products (i.e. buffalo milk) are an important source of fat, vitamin B2, vitamin B12 and calcium.

Table 6.1.3. Havell agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat flour, white	266	9.0	11 140	5.2	17.2	15.5	3.2	0.0	0.0	7.8	3.5	19.2	3.2	3.3	0.0	1.3	14.1	10.4
Maize, yellow, dried, raw	595	20.2	22 060	10.4	38.1	32.4	14.7	1.7	0.0	52.7	16.1	21.6	44.9	7.4	0.0	2.6	23.6	49.2
Breastmilk	194	6.6	0	0.0	2.3	1.1	5.5	2.5	3.3	0.9	1.7	1.5	0.2	1.0	3.0	2.1	0.0	0.6
Tea, powder	6	0.2	4 553	2.1	0.4	0.7	0.0	0.0	0.0	0.0	1.6	1.3	0.3	0.4	0.0	0.3	0.2	0.3
Sugar, white	39	1.3	2 581	1.2	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1
Cookies (bakery)	11	0.4	2 685	1.3	0.9	0.3	1.6	0.0	0.0	0.1	0.1	0.4	0.1	0.1	0.1	0.1	2.0	0.1
Egg, chicken, domestic, cooked	31	1.0	8 319	3.9	1.0	2.5	3.0	1.8	0.0	1.2	2.7	2.3	0.5	0.9	12.6	0.8	4.1	1.7
Ghee, cow	33	1.1	4 208	2.0	5.6	0.0	24.4	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0
Turmeric, dried	8	0.3	3 038	1.4	0.5	0.3	0.5	0.0	0.0	0.2	0.3	0.7	1.8	0.2	0.0	0.5	3.8	0.8
Cumin, seeds	< 1	0.0	893	0.4	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.4	0.1
Grass pea, split dried, raw	20	0.7	1 518	0.7	1.3	3.1	0.1	0.0	0.0	1.7	1.0	1.1	0.9	2.6	0.0	0.5	1.5	1.7
Leaf, fenugreek	361	12.3	37 118	17.5	2.5	7.3	0.5	24.4	51.2	7.4	16.9	8.5	23.7	23.3	0.0	29.4	15.6	3.7
Salt	3	0.1	72	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maize, grain or flour, local	130	4.4	5 302	2.5	8.7	5.8	3.4	0.8	0.0	11.5	6.4	10.7	4.7	2.0	0.0	0.3	6.3	5.9
Fennel, seeds	6	0.2	2 924	1.4	0.4	0.6	0.7	0.0	0.0	0.6	0.6	1.4	0.4	0.0	0.0	3.0	1.5	0.6
Milk, buffalo	712	24.1	70 252	33.1	13.1	16.0	34.8	11.3	3.1	8.1	29.9	13.8	4.3	2.6	51.7	40.9	0.0	9.0
Egg, chicken, farmed, raw	80	2.7	15 907	7.5	2.1	6.3	5.2	3.4	0.0	3.3	7.9	4.9	1.4	2.5	32.5	0.0	8.5	4.8
Spinach, raw	438	14.8	15 649	7.4	2.1	7.1	1.6	46.6	39.8	3.0	9.7	11.1	10.3	52.6	0.0	15.1	13.7	9.9
Spearmint leaf, raw	< 1	0.0	279	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Chilli, red, dry	6	0.2	2 148	1.0	0.4	0.6	0.3	1.3	1.3	1.4	0.7	1.0	1.9	0.4	0.0	0.4	0.2	0.4
Bay leaf, dried	6	0.2	1 559	0.7	0.4	0.3	0.4	0.5	1.3	0.0	0.7	0.5	1.4	0.7	0.0	2.1	3.9	0.6
Total	2 947	100	212 205	100	100	100	100	100	100	161	144	155	257	173	115	100	100	100
% target met					100	212	101	254	209	161	144	155	257	173	115	100	101	242

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy, fat, calcium and iron is only just met for the CoD family in all seasons of the year. The RNI for all other nutrients is comfortably exceeded and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-7).

### 6.1.8 Seasonal fluctuations in the food habits nutritious diet

Prices are generally slightly higher in winter, while the prices of a specific food group, that of vegetables, tend to be higher in the summer.

### 6.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Dairy i.e. milk and milk products, followed by vegetables and vegetable products, are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Haveli district (Annex 3.7-7). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost of the FHAB diet, yet they are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients. However, the price of vegetables is higher in summer which might result from scarcity during this period of the year.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to fulfilling nutrient requirements, providing 38 per cent of total energy needs, 20 per cent of protein, 69 per cent of fat, , 57 per cent of vitamin B12, 28 per cent of vitamin C and 30 per cent of calcium needs. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Fenugreek (leaf) and wheat flour (white) were selected by the software as important sources of iron.

### 6.1.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a nutritious diet. The gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 6.1.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB is not affordable for very poor, poor, middle and better-off households while the NUT diet is not affordable for very poor, poor and middle households.

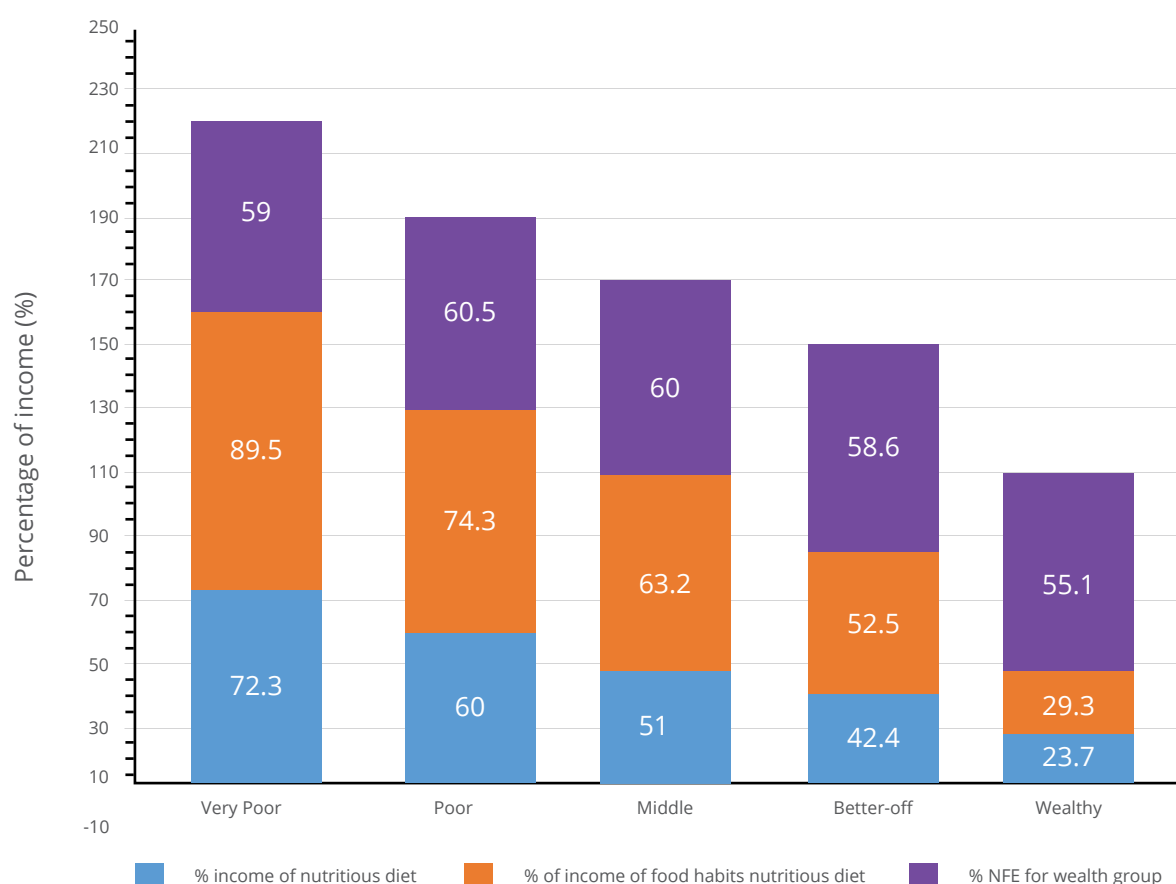
Table 6.1.4: Haveli agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	171,341	72.3	212,205	89.5	139,830	59.0
Poor	285,912	171,341	60	212,205	74.3	172,927	60.5
Middle	336,240	171,341	51	212,205	63.2	201,890	60.0
Better-off	404,016	171,341	42.4	212,205	52.5	236,908	58.6
Wealthy	725,412	171,341	23.7	212,205	29.3	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 6.1.1 visually represents the affordability analysis for the five wealth groups in Haveli's agriculture livelihood zone based upon the numbers presented in Table 6.1.4 above. The results show that only the wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. For the rest, the affordability gap expressed as a percentage of income is 49 per cent for very poor, 35 per cent for poor, 23 per cent for middle and 11 per cent for better-off households. The additional amount of money these households require per year to afford a FHAB diet plus non-food expenditure is 115,131 PKR, 99,220 PKR, 77,855 and 45,097 PKR respectively.

Figure 6.1.1: Haveli agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income





### 6.1.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### **Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.**

Availability of foods is not a challenge in Haveli district's agriculture livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is 49 per cent and 35 per cent of income, respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>8</sup> Activities could be identified through district-specific household economic approach studies.

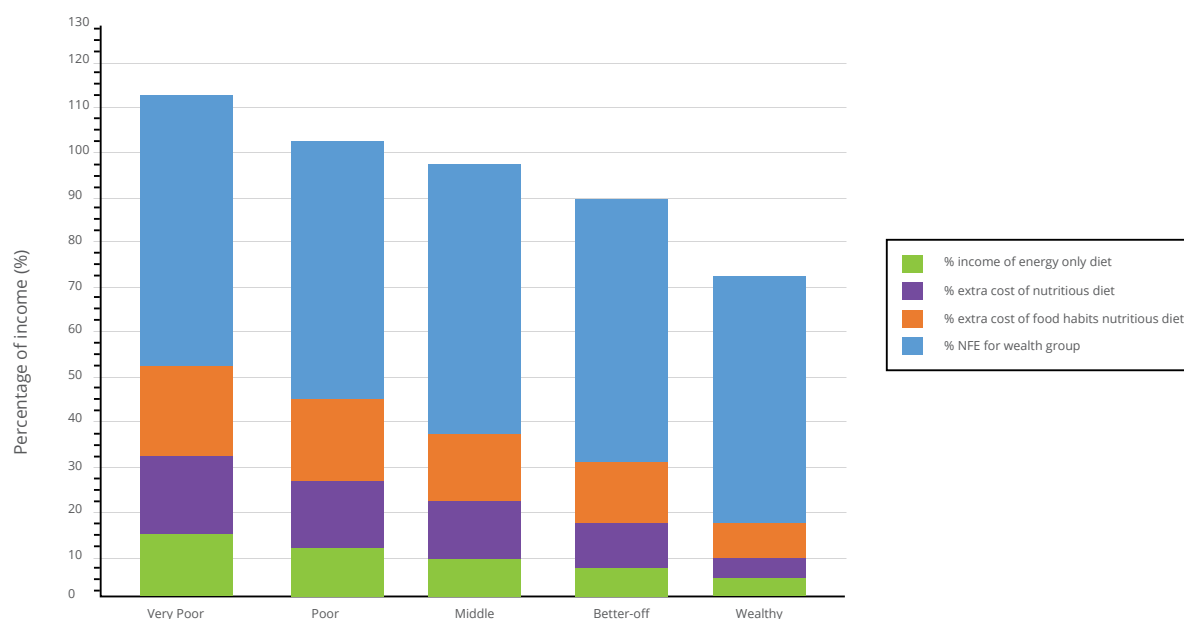
#### **Model 2. The impact of buffalo rearing on the cost, quality, composition and affordability of a FHAB diet.**

Buffalo milk is widely consumed in the district. FGD participants said most people in the area are rearing their own buffalos. The software identified buffalo milk as an important source of fat, vitamin B2, vitamin B12 and calcium. However, it contributes one-third (33 per cent) of the total cost of the FHAB diet. The model brings the cost of buffalo milk by simulating self-production and promoting rearing of buffalos to supply households with milk. The model assumes provision of buffalos on revolving fund basis with training to households at the initial stage of the project. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 124,600 PKR which is still beyond the reach of the very poor and poor, however, it significantly narrows the gap to 12 per cent and 4 per cent of annual income respectively. The model assumes that this gap could be filled with the additional income generated from the sale of part of the production (Figure 6.1.2).

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<sup>8</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

Figure 6.1.2: Haveli agriculture zone: Affordability of EO, NUT and FHAB with buffalo rearing

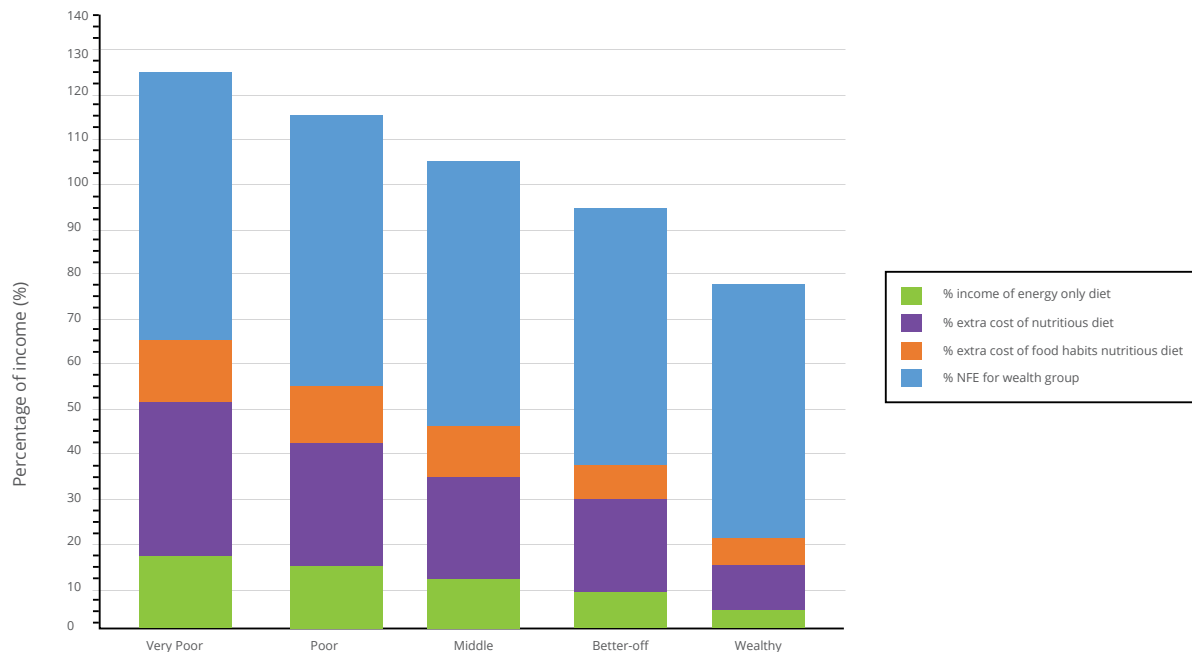


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 212,200 PKR which is not affordable for very poor, poor, middle and better-off households. When family size is reduced to five, the cost is significantly reduced to 154,400 PKR, which is affordable by better-off households, leaving a 24 per cent gap for very poor, 15 per cent for poor and 6 per cent for middle households (Figure 6.1.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 6.1.3: Haveli agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 6.1.12 Key findings

**The FHAB diet is approximately 3.7 times as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet is thrice as expensive as the EO diet, meaning that it costs three times as much to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is 3.7 times as expensive as the EO diet and 1.2 times more expensive than the NUT diet which does not consider food habits. This means that the constraints applied to reflect typical dietary habits require the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a nutritious diet, wheat (brown, wholegrain, raw) provides most of the essential micronutrients in the agriculture livelihood zone of Haveli district.**

The NUT diet, which does not consider local food habits, is hypothetical, but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software includes wheat (brown wholegrain raw) as a locally-available inexpensive source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6 and iron contributing most of these nutrients. However, FGD participants believed it is not available in nearby markets, and it has not been included in the FHAB diet.

**Vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software only reached about 100 per cent of the RNI for vitamin B12 and calcium in the NUT diet. Thus, while the software has found a solution, these nutrients whose specification have been met only by

100 per cent are the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has shown that the recommended intakes of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the nutritious diet are all available in almost all the markets visited and are therefore considered to be available in Haveli's agriculture livelihood zone. The FGD participants also confirmed availability of a variety of foods in the market but are limited by their economic capacity and seasonality. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The comparison of total annual household incomes, non-food expenditure and the annual cost of the three diets indicates that only the wealthiest quintile can afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food types, which are ascribed "hot" or "cold" effects in traditional medicine, are taboo for pregnant and breastfeeding mothers. This is because these foods are believed to cause abdominal upset in the mother and to harm the foetus/baby.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of the child aged 12–23 months.

## **6.1.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements for energy and micronutrients.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as wheat flour (brown, wholegrain, raw).

## Recommendations

### **Dietary modification is needed to improve quality, composition and affordability of nutritious diets.**

The CoD analysis indicates that wheat flour (brown, wholegrain, raw) is an important source of micronutrients such as vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc at minimum cost, however this food is not frequently consumed and is therefore not included in the FHAB diet. Promoting its frequent consumption through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care required by lactating mothers in terms of increasing the amount, frequency and variety of foods.

### **Promoting buffalo rearing helps improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The model promoting buffalo rearing lowers the annual cost of the FHAB diet making it affordable even for the poor. It also increases income which further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable for very poor, poor and middle households, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 49 per cent, 35 per cent and 23 per cent of income for very poor, poor and middle households, respectively. Scaling up of carefully designed safety net interventions through

cash transfer or cash for work programmes for the very poor and poor would allow these households to purchase a variety of foods from local markets, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## **6.2 Haveli district, livestock/poultry livelihood zone**

### **6.2.1 Market survey to collect price data**

Surveys were conducted in the following six villages: Aliabad, Budhal, Chanjal, Kailar-Fatehpur, Kulali and Sangal. The reference year selected for data collection was 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 28 February 2018
- Season 2 (Autumn): 1 September 2017 – 15 November 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 1 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.8.

### **6.2.2 Availability of foods in the local markets**

The data collection team found 85 foods in the markets of the six villages of the livestock/poultry livelihood zone in Haveli district:

- 13 types of grains and grain-based products,
- 3 types of roots and tubers,
- 8 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 2 varieties of fish and seafoods,
- 2 varieties of eggs,
- 2 types of milk and milk products,
- 12 types of vegetables,



- 11 types of fruits,
- 4 types of fats/oils,
- 6 types of sugars and confectionary,
- 15 varieties of herbs, spices and condiments including salt, and
- 3 types of beverages.

### 6.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten daily. Most of the women said white flour is cheaper and better to prepare bread and wholegrain flour is generally not available. Corn was said to be available and widely consumed in some villages, especially during winter. FGD participants said most people in the area rear their own buffalos.

All the women in the FGDs said no special foods are given to pregnant women or lactating mothers, who eat what other members of the family eat as they can't afford special foods. However, certain foods such as organic butter, fruits, eggs, soup broth and milk are said to be good for pregnant women and families give them if they can afford to. Soft bread is also given but hard and heavy foods, such as beans, are not given as these are believed to affect the foetus and cause abdominal upset in the mother. These foods are also avoided by breastfeeding mothers for similar reasons. In addition, acidic and spicy foods are believed to cause abdominal irritation and are therefore not given to them.

Children aged 6–23 months are mostly fed on milk, khichri (rice with lentils and meat) and banana. Acidic and cold foods are believed to cause abdominal upset and sore throat and are not given to them.

People suffering from illness are given porridge, soft foods and milkshakes. These foods are light and believed to facilitate recovery.

Nearly the FGD participants acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables. Some households reported self-production of wheat and milk on the land they own or lease, and from animals that they keep, respectively.

The food taboos described above indicate cost is not the only factor that influences consumption. Although these foods are available in the market, they are not consumed because of local dietary habits.

### 6.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 6.2.1).

Table 6.2.1: Haveli livestock/poultry zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	148.21
Macronutrients diet (MAC)	Yes	4	3	155.88
Nutritious diet (NUT)	Yes	15	9	455.31
Food habits nutritious diet (FHAB)	Yes	17	9	578.71

\* Averaged across seasons.

### 6.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to be 148.21 PKR per day and does not change across seasons. It features only two of the 85 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for a typical family is estimated to be 54,100 PKR (Annex 3.1-8).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key foods in the EO diet selected by the software are wheat flour (brown, wholegrain, raw) and maize (yellow, dried, raw).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely solely on this diet for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. RNIs for fat, vitamins including vitamin A, vitamin B2, pantothenic acid, folic acid, vitamin B12 and vitamin C, and minerals including calcium and iron, are not met by this diet (Annex 3.2-8).

### 6.2.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 422.96–476.89 PKR per day, depending on the season. Lactating mothers are the most expensive family members (Annex 3.3-8).

The NUT diet includes 14 of the 85 foods known to be eaten by people in the livestock/poultry zone of Haveli district, however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat (brown, wholegrain) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C, folic acid and calcium and provides most of these nutrients in the diet. Additionally, ghee (cow) is selected to provide fat; and milk (buffalo) and fish (rohu, river, raw) to provide vitamin B12 (Table 6.2.2).

Table 6.2.2: Haveli livestock/poultry zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	963	31.9	35 139	21.1	59.8	54.8	14.8	0.1	0.0	77.4	40.5	65.5	53.2	11.6	0.0	19.4	53.6	60.2
Wheat, flour, white	59	2.0	2 376	1.4	3.8	3.2	0.7	0.0	0.0	1.3	0.8	2.6	0.8	0.5	0.0	0.3	2.6	1.9
Maize, yellow, dried, raw	105	3.5	3 691	2.2	6.8	5.3	2.6	0.2	0.0	6.8	2.9	2.3	8.9	0.9	0.0	0.5	3.4	7.1
Breadmilk	194	6.4	0	0.0	2.3	1.0	5.6	1.9	3.2	0.7	1.7	0.9	0.2	0.7	3.2	2.1	0.0	0.5
Cookies (bakery)	6	0.2	1 482	0.9	0.5	0.1	0.9	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.9	0.0
Egg, chicken, domestic, cooked	16	0.5	3 594	2.2	0.5	1.3	1.6	0.8	0.0	0.5	1.5	0.7	0.3	0.3	7.3	0.4	1.8	0.7
Ghee, cow	54	1.8	7 114	4.3	9.1	0.0	40.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0
Milk, cow, whole fat, pasteurized, UHT	81	2.7	8 056	4.8	0.9	1.3	2.2	0.5	0.7	0.8	5.5	0.7	0.6	0.3	12.5	3.2	0.2	0.8
Turneric, dried	4	0.1	976	0.6	0.2	0.1	0.2	0.0	0.0	0.1	0.1	0.2	0.9	0.1	0.0	0.2	1.3	0.3
Fenugreek, leaf	46	1.5	4 817	2.9	0.3	0.9	0.1	2.4	6.3	0.7	2.2	0.7	3.4	2.0	0.0	3.7	1.6	0.4
Milk, buffalo	379	12.6	37 910	22.8	7.0	7.8	18.7	4.6	1.6	3.1	16.0	4.4	2.6	0.9	29.7	21.8	0.0	3.9
Egg, chicken, farmed, raw	45	1.5	7 466	4.5	1.2	3.3	3.0	1.5	0.0	1.4	4.4	1.7	0.9	0.9	19.8	0.0	3.9	2.2
Spinach, raw	998	33.1	36 529	22.0	4.8	14.9	3.6	81.1	88.2	4.9	22.3	15.3	26.4	80.5	0.0	34.5	25.4	18.5
Fish, rohu, river, raw	47	1.6	14 701	8.8	0.8	3.9	0.9	0.0	0.0	0.4	0.8	3.1	0.7	0.0	27.4	11.8	2.7	1.1
Mustard, seeds	19	0.6	2 339	1.4	1.8	2.2	5.0	0.0	0.0	2.1	1.3	1.7	1.0	1.3	0.0	1.9	2.0	2.4
Total	3 017	100	166 188	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	231	100	332	215	223	144	257	229	258	106	100	123	297

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Haveli's livestock/poultry livelihood zone are given in Annex 3.4-8. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, calcium is met only to 100 per cent of RNI, signifying that the software found this nutrient to be the hardest to meet using locally-available foods.

### 6.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the livestock/poultry livelihood zone of Haveli but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 574.51–583.33 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-8).

Table 6.2.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Haveli district's livestock/poultry livelihood zone.

Sixteen of the 85 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software for this diet, maize (yellow, dried, raw) is an important source of protein, energy, vitamin B1, niacin, vitamin B6, iron and zinc, providing most of these nutrients. Additionally it includes spinach for vitamin A and folic acid, fenugreek (leaf) for vitamin C and calcium, and dairy products (buffalo milk) for fat, vitamin B2 and vitamin B12.

Table 6.2.3: Haveli livestock/poultry zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	%	Cost (PKR)	% cost	energy	%	protein	%	fat	%	vit A	%	vit C	%	vit B1	%	vit B2	%	niacin	%	vit B6	%	folic acid	%	vit B12	%	calcium	%	iron	%	zinc	%
Wheat, flour, white	272	9.1	10 874	5.1	17.6	15.8	3.3	0.0	0.0	0.0	7.8	3.6	20.9	2.9	3.4	0.0	1.3	14.5	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maize, yellow, dried, raw	755	25.3	26 416	12.5	48.3	41.1	18.8	2.0	0.0	0.0	65.4	20.4	29.2	51.1	9.4	0.0	3.4	30.2	60.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Breadmilk	194	6.5	0	0.0	2.3	1.1	5.6	2.5	3.0	0.0	0.9	1.7	1.6	0.2	1.0	2.9	2.1	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Tea, powder	6	0.2	4 521	2.1	0.4	0.7	0.0	0.0	0.0	0.0	0.0	1.6	1.4	0.3	0.4	0.0	0.3	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Sugar, white	39	1.3	2 533	1.2	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Cookies (bakery)	11	0.4	2 748	1.3	0.9	0.3	1.6	0.0	0.0	0.0	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	2.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ghee, vegetable	1	0.0	247	0.1	0.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Egg, chicken, native, cooked	82	2.7	18 969	9.0	2.7	6.8	7.9	4.8	0.0	0.0	3.1	7.2	6.4	1.2	2.3	32.1	2.2	10.9	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ghee, cow	36	1.2	4 643	2.2	5.9	0.0	26.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Milk, cow, whole fat, pasteurized, UHT	85	2.8	8 465	4.0	1.0	1.4	2.3	0.7	0.6	1.2	5.7	5.7	1.2	0.5	0.4	11.7	3.4	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turmeric, dried	9	0.3	2 578	1.2	0.6	0.4	0.6	0.0	0.0	0.0	0.2	0.4	0.8	1.8	0.2	0.0	0.6	4.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fenugreek, leaf	479	16.0	49 565	23.5	3.3	9.7	0.7	31.5	60.7	9.6	22.4	22.4	12.1	28.2	31.1	0.0	39.0	20.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Salt	3	0.1	64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Milk, buffalo	580	19.4	57 965	27.4	10.7	13.0	28.5	9.0	2.2	6.4	24.2	24.2	12.0	3.2	2.2	40.4	33.3	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Egg, chicken, farmed, raw	33	1.1	5 110	2.4	0.8	2.6	2.2	1.4	0.0	1.3	3.2	3.2	2.1	0.5	1.0	12.8	0.0	3.5	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Spinach, raw	397	13.3	14 555	6.9	1.9	6.5	1.4	41.2	32.3	2.6	8.8	8.8	10.8	8.4	48.0	0.0	13.7	12.5	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Chilli, red, dry	6	0.2	1 977	0.9	0.4	0.6	0.3	1.2	1.2	1.3	0.7	0.7	1.1	1.7	0.4	0.0	0.4	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total	2 988	100	211 230	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
% target met					100	212	100	261	234	164	145	100	146	286	172	120	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNIs for energy, fat, calcium and iron are only just met for the CoD family in all seasons of the year. All other nutrients are met more comfortably, at more than 100 per cent, and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-8).

### 6.2.8 Seasonal fluctuations in the food habits nutritious diet

There are no major seasonal fluctuations in the daily cost of the FHAB diet.

### 6.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Dairy, i.e. milk and milk products, followed by vegetables and vegetable products are the costliest elements of the FHAB diet for the CoD family in the livestock/poultry livelihood zone of Haveli district (Annex 3.7-8). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost of the FHAB diet, yet are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients.

In the FHAB diet for the child aged 12–23 months, it is important to note the significant contribution of breastmilk to nutrient requirements: 38 per cent of the total energy needs, 21 per cent of protein, 69 per cent of fat, 29 per cent of vitamin B2, 57 per cent of vitamin B12, 27 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Fenugreek (leaf) and wheat flour (white) were selected by the software as important sources of iron.

### 6.2.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 6.2.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor, middle and better-off households while the NUT diet is not affordable for very poor, poor and middle households.



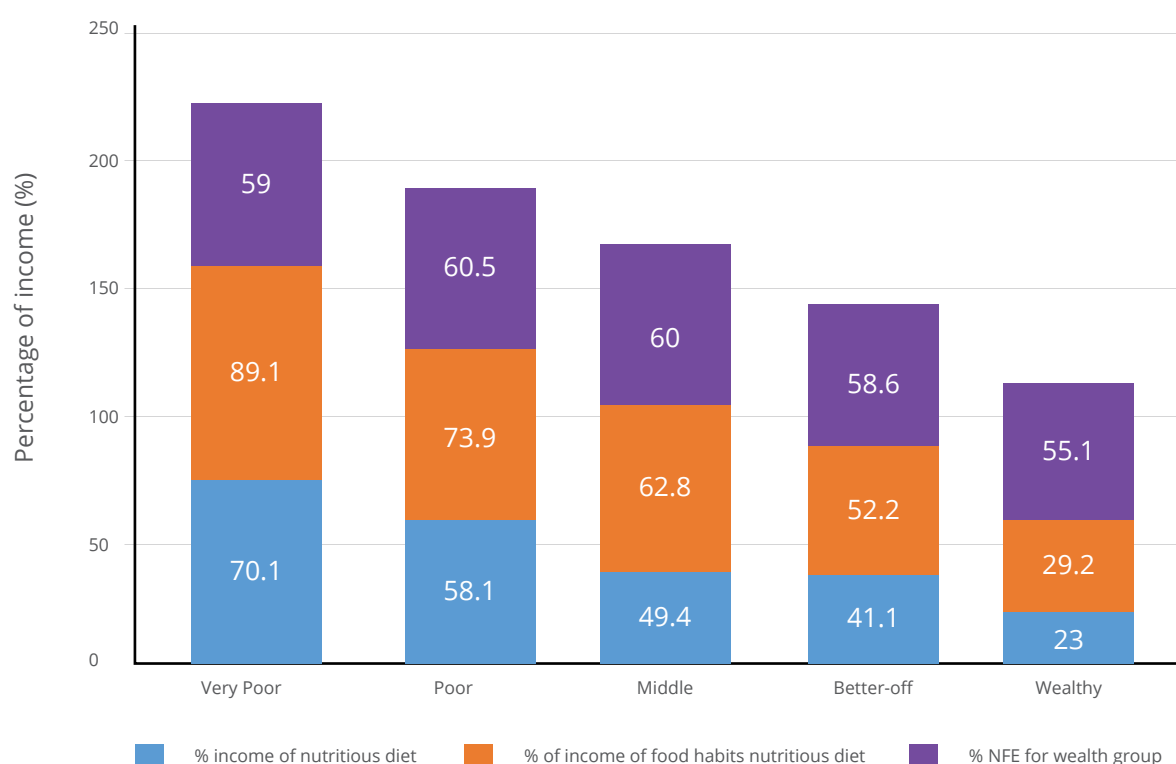
Table 6.2.4: Haveli livestock/poultry zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	166,188	70.1	211,230	89.1	139,830	59.0
Poor	285,912	166,188	58.1	211,230	73.9	172,927	60.5
Middle	336,240	166,188	49.4	211,230	62.8	201,890	60.0
Better-off	404,016	166,188	41.1	211,230	52.2	236,908	58.6
Wealthy	725,412	166,188	23	211,230	29.2	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 6.2.1 visually represents the affordability analysis for the five wealth groups in Haveli's livestock/poultry livelihood zone based upon the numbers presented in Table 6.2.4 above. The results show that only the wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 48 per cent for very poor, 34 per cent for poor, 23 per cent for middle and 11 per cent for better-off wealth groups respectively. The additional amount of money required per year to afford a FHAB diet plus non-food expenditure is 114,156 PKR, 98,245 PKR, 76,880 PKR and 44,122 PKR respectively.

Figure 6.2.1: Haveli livestock/poultry zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 6.2.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

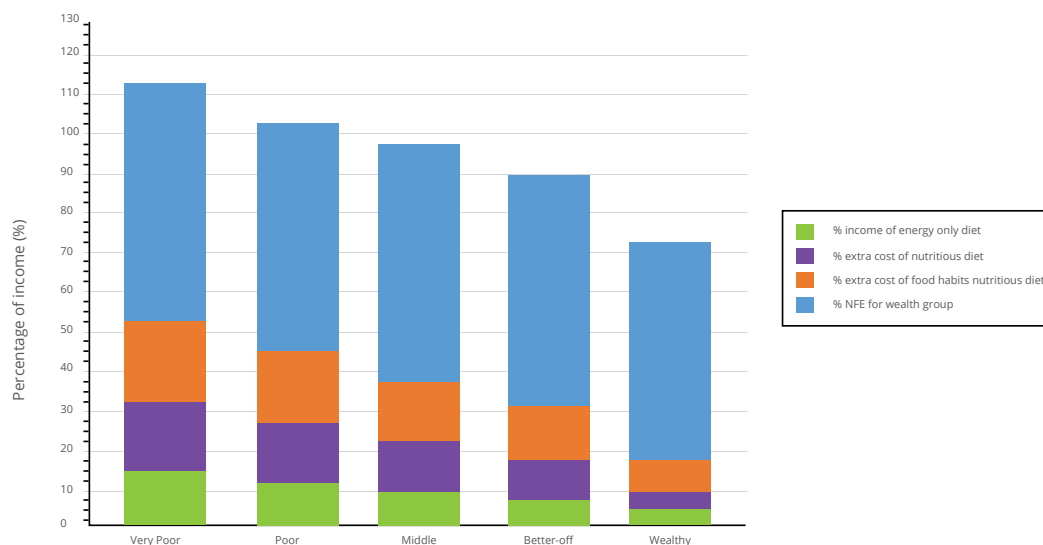
Availability of foods is not a challenge in Haveli district's livestock/poultry livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is currently 48 per cent and 34 per cent of income, respectively. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>9</sup> Activities could be identified through district-specific household economic approach studies.

#### Model 2. The impact of buffalo rearing on the cost, quality, composition and affordability of a FHAB diet.

Buffalo milk is widely consumed in the district and many families rear their own buffalos. The software identified buffalo milk to be an important source of fat, vitamin B2, vitamin B12 and calcium but also contributes 27 per cent of the total cost of the FHAB diet. The model brings this cost to zero by simulating self-production by promoting the rearing of buffalos to supply households with milk. The model assumes buffalos are provided on a revolving fund basis with training given to households at the initial stage of the project. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 125,200 PKR which is still beyond the reach of the very poor and poor, however, it significantly narrows the affordability gap to 12 per cent and 4 per cent of annual income respectively. The model assumes that this gap could be filled with the additional income generated from the sale of part of the production (Figure 6.2.2).

<sup>9</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

Figure 6.2.2: Haveli livestock/poultry zone: Affordability of EO, NUT and FHAB diets with buffalo rearing

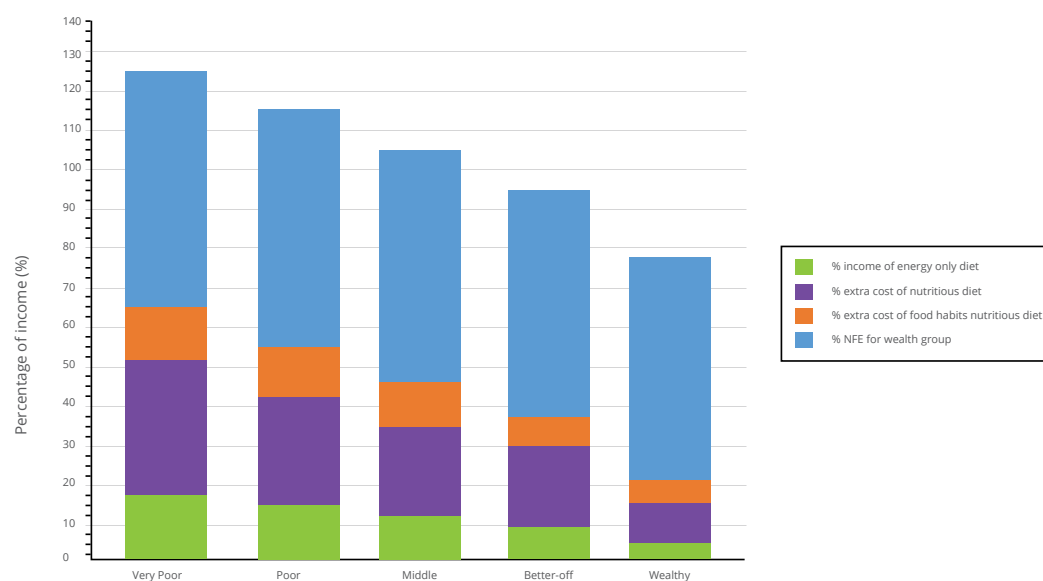


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 211,200 PKR which is not affordable for very poor, poor, middle and better-off households. When the family size is reduced to five, the cost is significantly reduced to 153,000 PKR, leaving a 24 per cent and 14 per cent affordability gap for very poor and poor households respectively (Figure 6.2.3). However, a corresponding reduction in non-food expenditure is expected which will bring the cost further down and enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 6.2.3: Haveli livestock/poultry zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 6.2.12 Key findings

#### **The FHAB diet is approximately four times more expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet, which does not consider food habits, is thrice as expensive as the EO diet, meaning that it costs three times as much money to meet protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is four times as expensive as the EO diet and 1.3 times as expensive as the NUT diet. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

#### **In a NUT diet, wheat (brown, wholegrain, raw) and fish (rohu, river, raw) provide most of the essential micronutrients in the livestock/poultry livelihood zone of Haveli district.**

The NUT diet, which does not consider local food habits, is hypothetical but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software has included wheat flour (brown, wholegrain, raw) and fish (rohu, river, raw) both of which are not included in the FHAB diet. Wheat (wholegrain) is an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, while fish provides vitamin B12 and calcium. FGD participants, however, said the wholegrain flour is not available and fish is not consumed for people are not interested in fishing.

#### **Calcium is the hardest nutrient for the software to meet using locally-available foods.**

The software met specifications for calcium only by 100 per cent in the NUT diet. While the software has found a solution, this nutrient is thus the hardest for it to meet using locally-available foods, even if local dietary preferences are not accommodated.

#### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has identified that the RNIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. At least 100 per cent of RNI has been achieved for every mineral or vitamin using foods from the local markets. The foods selected by the software for the NUT diet are all available in almost all markets visited and are therefore considered to be available in the Haveli district livestock/poultry livelihood zone. The FGD participants also confirmed that a variety of foods is available in the market but limited by economic capacity and seasonality. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

#### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The comparison of total annual household incomes, non-food expenditure and the annual cost of the three diets indicates that very poor, poor, middle and better-off households cannot afford the FHAB diet. This is because the software considers typical dietary habits, such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and selects more expensive foods to comply with local dietary habits.

### **Some nutritious foods are taboo for children, pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food types are believed to be not healthy for children aged 12–23 months, pregnant women and breastfeeding mothers.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **6.2.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for children aged 12–23 months.
- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as wheat flour (brown wholegrain raw).

### **Recommendations**

Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.

The CoD analysis indicates that wheat flour (brown, wholegrain, raw) is an important source of micronutrients such as vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and fish (rohu, river, raw) is an important source of vitamin B12 at minimum cost. These foods are not frequently consumed and are therefore not included in the FHAB diet although they were found to be available in local markets. Promoting their frequent consumption through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care lactating mothers require in terms of increasing the amount, frequency and variety of foods they receive.

### **Promoting buffalo rearing helps improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling showed that promoting buffalo rearing can lower the annual cost of the FHAB diet making it affordable even for the poor. It also increases income, further improving affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that at current income levels, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

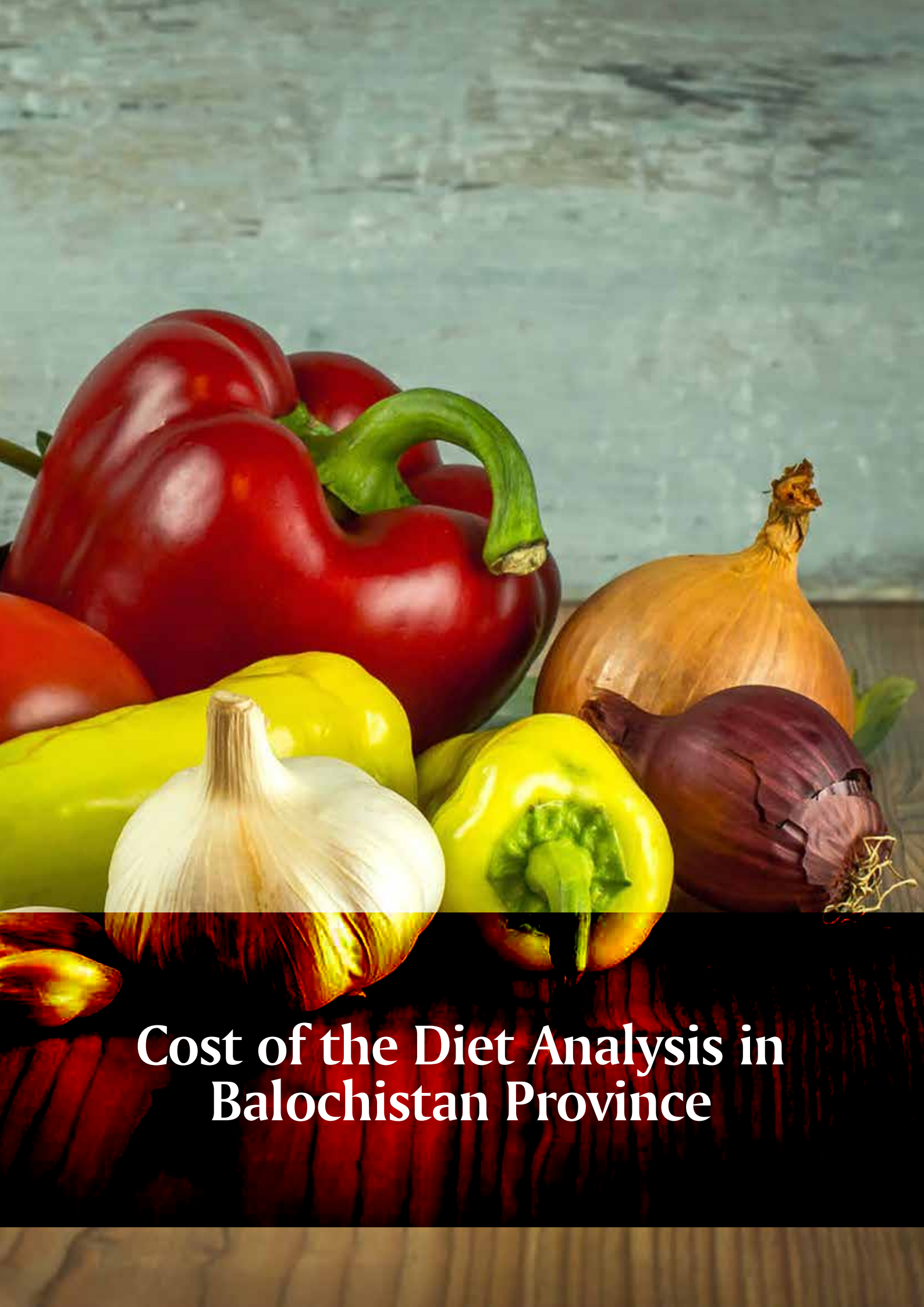
The affordability gap for the FHAB diet is 48 per cent, 34 per cent, 23 per cent and 11 per cent of income for very poor, poor, middle and better-off households respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes for the very poor and poor would allow these households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.







# Cost of the Diet Analysis in Balochistan Province



# 07.

## Cost of the Diet Analysis in Balochistan Province

### 7.1 Loralai district, agriculture livelihood zone

#### 7.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Asghar Loon, Bypass, Commissioner, Dhobi Ghat, Loralai Town and Naseerabad. The reference year selected for data collection was 16 February 2017 to 15 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 November 2017 to 15 February 2018
- Season 2 (Autumn): 1 August 2017 to 31 October 2017
- Season 3 (Summer): 1 May 2017 to 31 July 2017
- Season 4 (Spring): 16 February 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item, can be found in Annex 1.9.

#### 7.1.2 Availability of foods in the local markets

The data collection team found 126 foods in the markets of the six villages of the agriculture livelihood zone in Loralai district:

- 18 types of grains and grain-based products,
- 4 types of roots and tubers,
- 14 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 3 varieties of fish and seafoods,
- 2 varieties of eggs,
- 5 types of milk and milk products,
- 14 types of vegetables,
- 15 types of fruits,
- 10 types of fats/oils,
- 10 types of sugars and confectionary,

- 18 varieties of herbs, spices and condiments including salt,
- 7 types of beverages, and
- 2 composite dishes.

### 7.1.3 Typical food consumption habits and food taboos

The interviews and FGDs show that wheat is the staple food in the assessment area and is eaten daily. Most of the women said they use white flour which is better to prepare the thin bread the family prefers. Sorghum is not consumed in the area and millet was said to be used to feed birds. Milk and eggs were said to be available at home and are not usually purchased from the market.

All the women in the FGDs said pregnant women are usually given milk and fruits which are good for the foetus. Foods that are hot, beef and pulses, such as beans, were not given. The pulses form gas in the stomach which they believe is not good for the foetus. Lactating mothers were said to be given milk to facilitate breastmilk production. Spicy foods and sour foods such as yogurt are not given as they are believed to decrease breastmilk production.

Children aged 6–23 months are mostly fed on soft foods such as curry, milk and biscuits with tea. Beef was generally said not to be given to children for it is believed to be indigestible for them. Foods with chillies are also not given to children.

People suffering from illness are given soft foods such as soup and broth with bread. Mutton and milk were also said to be good for the unwell.

Nearly all the FGD participants acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 7.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 7.1.1).

Table 7.1.1: Loralai agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	4	2	109.58
Macronutrients diet (MAC)	Yes	5	3	123.52
Nutritious diet (NUT)	Yes	13	8	310.53
Food habits nutritious diet (FHAB)	Yes	22	12	443.86

\* Averaged across seasons.

### 7.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 108.14 PKR and 110.54 PKR per day depending on the season. It features only three of the 126 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 40,000 PKR (Annex 3.1-9).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the cost of the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day.

The key foods in the EO diet selected by the software are sorghum (grain or flour, local, raw) and wheat (local or hyv).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as relying on it for extended periods is likely to cause undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Loralai district's agriculture livelihood zone across all seasons, the RNIs for fat, vitamins including vitamin A, vitamin B2, folic acid, vitamin B12 and vitamin C, and minerals including calcium, are not met by this diet (Annex 3.2-9).

### 7.1.6 Nutritious diet

A NUT diet that meets both average energy requirements and the RNIs for micronutrients is estimated to cost a minimum of 308.22–313.64 PKR per day, depending on the season. Lactating mothers are the most expensive family members (Annex 3.3-9).

The NUT diet includes 12 of the 126 foods known to be eaten by people in the agriculture zone of Loralai district, however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Sorghum (raw) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Additionally, goat milk is selected to provide vitamin B12, ghee (cow) to provide fat and baking powder to provide calcium (Table 7.1.2).

Table 7.1.2: Loralai agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (Kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Baking powder	9	0.4	9 233	8.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.3	0.0	0.0
Breastmilk	194	7.9	0	0.0	2.3	1.2	5.6	3.7	6.0	1.1	2.3	1.2	0.4	1.4	3.4	2.1	0.0	0.7
Milk, goat	455	18.6	36 501	32.2	5.8	9.4	13.8	5.6	4.2	6.2	13.6	6.4	4.8	0.4	75.2	26.7	2.4	4.3
Ghee, cow	67	2.7	8 680	7.7	11.2	0.0	49.2	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0
Milk, cow, whole fat, pasteurized, UHT	48	2.0	4 011	3.5	0.6	0.9	1.3	0.6	0.8	0.8	4.5	0.5	0.6	0.3	8.0	1.9	0.1	0.7
Sorghum, raw	743	30.3	19 550	17.2	48.4	43.8	18.1	0.0	0.0	43.7	32.5	30.2	42.2	12.3	0.0	7.2	54.2	37.7
Salt	2	0.1	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millet, pearl, local	97	4.0	4 468	3.9	6.5	6.6	3.6	0.4	0.0	7.1	7.5	7.4	6.4	2.6	0.0	1.6	9.8	9.5
Egg, chicken, farmed, raw	28	1.2	6 281	5.5	0.7	2.4	1.9	1.8	0.0	1.5	3.8	1.3	1.0	1.2	13.3	0.0	2.7	2.1
Spinach, raw	451	18.4	14 682	13.0	2.2	7.8	1.6	71.2	74.2	3.8	13.6	8.8	20.0	72.6	0.0	15.6	12.8	12.8
Guava, green	8	0.3	685	0.6	0.1	0.0	0.0	0.1	14.8	0.5	0.3	0.1	0.2	0.3	0.0	0.1	0.1	0.1
Wheat, flour, brown, whole (Wheat, whole, raw)	7	0.3	253	0.2	0.5	0.5	0.2	0.0	0.0	1.0	0.3	0.6	0.5	0.2	0.0	0.1	0.4	0.6
Wheat, local or hyv	339	13.9	8 984	7.9	21.4	27.1	4.8	0.0	0.0	34.2	21.7	43.5	23.9	8.7	0.0	4.5	16.7	31.2
Total	2 451	100	113 342	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	200	100	171	116	130	106	203	137	130	100	100	111	194

The percentage of target met is an average of the % nutrient requirements met over the year.



The percentages of RNI met for essential macro- and micronutrients by the NUT diet for the typical family in the Loralai agriculture livelihood zone are given in Annex 3.4-9. These show that foods available in local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12 and calcium were met only to about 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 7.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Loralai but reflects the least expensive way for the typical family to meet specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 432.81–453.97 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-9).

Table 7.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Loralai district's agriculture livelihood zone.

Twenty-one of the 126 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software for this diet, wheat flour (wholegrain, brown, raw) is an important source of protein, energy, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, providing most of these nutrients. Additionally, spinach is an important source of vitamin A, vitamin C and folic acid, ghee (cow) is an important source of fat, baking powder is an important source of calcium, and goat milk is an important source of vitamin B12.

Table 7.1.3: Loralai agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (Kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	477	17.7	17 917	11.1	29.7	28.8	7.3	0.1	0.0	39.7	25.8	32.1	34.2	11.8	0.0	9.6	31.2	35.2
Baking powder	9	0.3	9 011	5.6	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.3	0.0	0.0
Breastmilk	194	7.2	0	0.0	2.3	1.1	5.6	4.4	6.5	0.7	2.2	0.9	0.3	1.4	2.9	2.1	0.0	0.6
Tea, powder	6	0.2	4 169	2.6	0.4	0.7	0.0	0.0	0.0	0.0	2.0	0.8	0.4	0.6	0.0	0.3	0.2	0.3
Milk, goat	375	13.9	30 058	18.6	4.7	7.1	11.4	5.3	3.7	3.1	10.6	4.1	3.0	0.3	52.4	22.0	2.1	2.7
Cookies (bakery)	15	0.5	3 389	2.1	1.3	0.4	2.3	0.1	0.0	0.1	0.2	0.3	0.2	0.1	0.2	0.1	2.7	0.1
Ghee, cow	71	2.6	9 190	5.7	11.8	0.0	52.1	20.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.0
Milk, cow, whole fat, pasteurized, UHT	4	0.1	331	0.2	0.0	0.1	0.1	0.1	0.1	0.0	0.4	0.0	0.0	0.0	0.6	0.2	0.0	0.0
Turmeric, dried	1	0.1	1 301	0.8	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.4	0.0	0.0	0.1	0.6	0.1
Horseradish	25	0.9	780	0.5	0.2	0.3	0.1	0.4	2.1	0.3	0.8	0.3	0.3	0.7	0.0	0.4	0.4	0.2
Cumin, seeds	2	0.1	2 229	1.4	0.1	0.2	0.2	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.6	1.0	0.2
Grass pea, split dried, raw	16	0.6	999	0.6	1.0	2.4	0.1	0.0	0.0	1.0	1.0	0.5	1.0	2.8	0.0	0.4	1.1	1.3
Salt	3	0.1	32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fennel, seeds	1	0.1	428	0.3	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.7	0.3	0.1
Egg, chicken, farmed, raw	110	4.1	25 245	15.6	2.9	8.6	7.3	8.2	0.0	3.5	14.1	4.1	2.9	4.7	43.9	0.0	11.4	6.4
Onion	424	15.8	21 986	13.6	3.5	3.2	0.6	0.0	17.6	2.9	2.7	2.5	9.7	5.4	0.0	3.6	1.1	2.1
Spinach, raw	319	11.9	10 380	6.4	1.5	5.1	1.1	58.6	56.2	1.6	9.1	4.9	11.0	52.7	0.0	11.0	9.6	7.0
Guava, green	6	0.2	479	0.3	0.1	0.0	0.0	0.1	11.1	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.0
Spearmint leaf, raw	< 1	0.0	295	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Chilli, red, dry	6	0.2	3 692	2.3	0.4	0.6	0.3	2.2	2.6	1.0	0.9	0.6	2.8	0.6	0.0	0.4	0.2	0.4
Wheat, flour, brown, whole (Wheat, whole, raw)	339	12.6	12 339	7.6	21.7	20.4	7.2	0.1	0.0	28.3	12.4	20.1	17.9	11.0	0.0	5.4	22.2	23.1
Wheat, local or hyv	283	10.5	7 759	4.8	17.9	20.8	4.0	0.0	0.0	17.3	17.1	28.4	15.5	7.5	0.0	3.7	14.7	20.1
Total	2 688	100	162 009	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	218	100	147	108	215	112	260	177	126	118	100	105	251

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy, fat, calcium and iron is only just met for the CoD family in all seasons of the year. The RNI for all other nutrients is comfortably exceeded and there is no nutrient that is difficult to obtain from foods found in the local markets of the six villages of Loralai district's agriculture livelihood zone (Annex 3.6-9).

### 7.1.8 Seasonal fluctuations in the food habits nutritious diet

The price of the FHAB diet is slightly higher in autumn, however there are no major seasonal fluctuations in the daily cost of the food habits diet.

### 7.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Grains and grain-based products are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Loralai district (Annex 3.7-9). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost of the FHAB diet and yet are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients. In terms of cost, these are followed by vegetables and vegetable products, and milk and milk products.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to meeting nutrient requirements. This contributes 38 per cent of the total energy needs of the child, 21 per cent of protein, 69 per cent of fat, 35 per cent of vitamin A, 32 per cent of vitamin B2, 54 per cent of vitamin B12, 44 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron, so it is important that iron-rich complementary foods are given to the child. Wheat flour (brown, wholegrain, raw) and spinach were selected by the software as important sources of iron.

### 7.1.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a nutritious diet. The gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 7.1.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households while the NUT diet is not affordable only for very poor households.

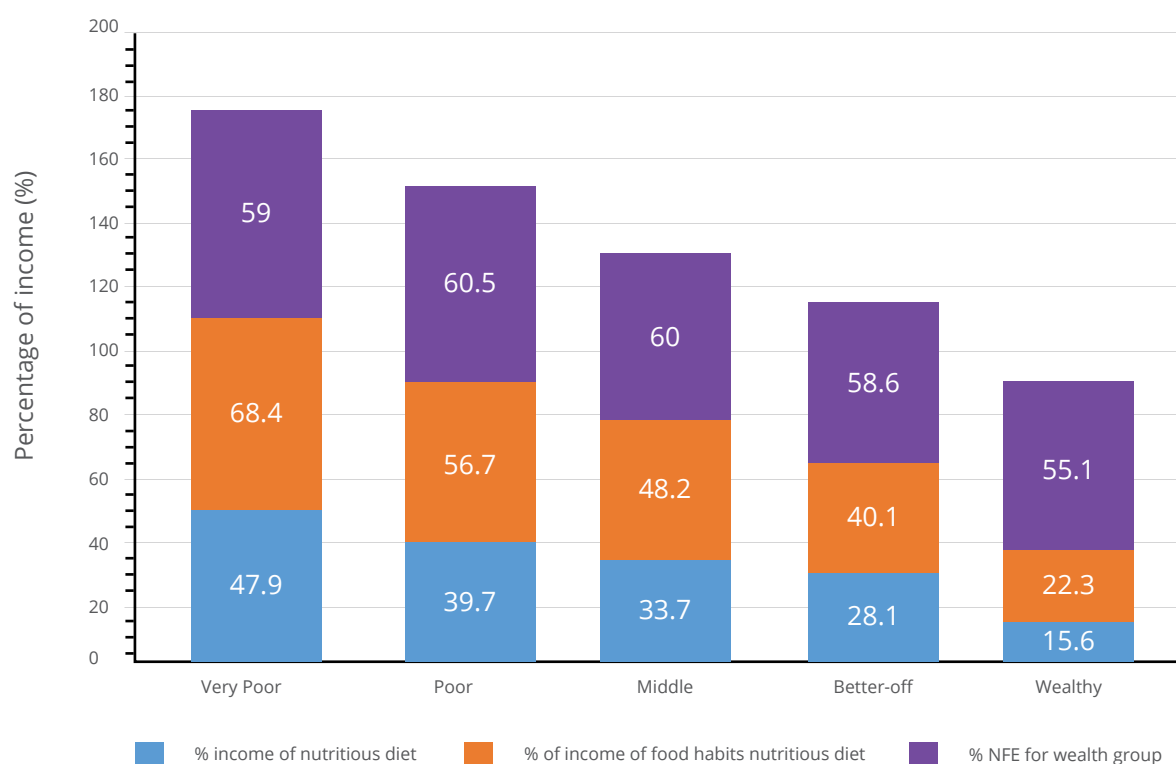
Table 7.1.4: Loralai agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	113,342,	47.9	162,009	68.4	139,830	59.0
Poor	285,912	113,342	39.7	162,009	56.7	172,927	60.5
Middle	336,240	113,342	33.7	162,009	48.2	201,890	60.0
Better-off	404,016	113,342	28.1	162,009	40.1	236,908	58.6
Wealthy	725,412	113,342	15.6	162,009	22.3	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 7.1.1 visually represents the affordability analysis for the five wealth groups in Loralai's agriculture livelihood zone based upon the numbers presented in Table 7.1.4 above. The results show that better-off and wealthy households can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, very poor, poor and middle households cannot. The affordability gap expressed as a percentage of income is 27 per cent for very poor, 17 per cent for poor and 8 per cent for middle wealth groups. The additional amount of money these households require per year to afford a FHAB diet plus non-food expenditure is 64,935 PKR, 49,024 PKR and 27,659 PKR respectively.

Figure 7.1.1: Loralai agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 7.1.11 Modelling nutritional interventions

Three interventions were modelled to examine the effects on the composition and cost of the diet.

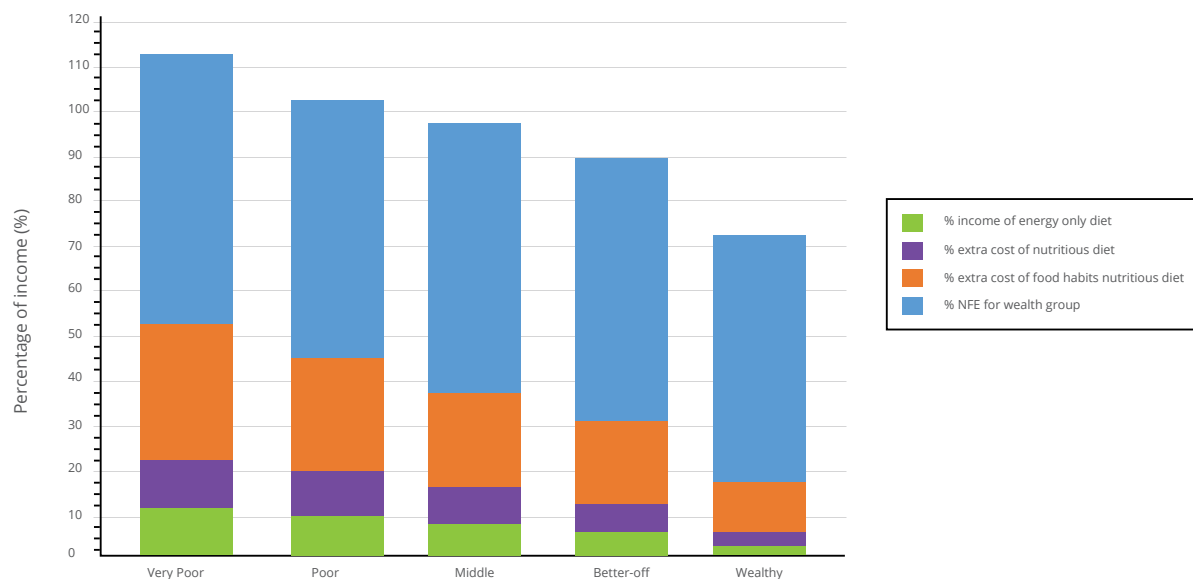
#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Loralai district's agriculture livelihood zone, and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The affordability gap of a FHAB diet for very poor and poor households is 27 per cent and 17 per cent of income, respectively. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>10</sup> Activities could be identified through district-specific household economic approach studies.

#### Model 2. The impact of dairy goat farming on the cost, quality, composition and affordability of a FHAB diet.

The software identified milk and milk products to be the second-most expensive food groups in the FHAB diet. Most of the cost comes from goat milk is an important source of vitamin B12, contributing most of this nutrient, and a significant proportion of calcium and vitamin B2 in the diet. However, it which contributes about 19 per cent of the total cost of the diet. This model brings down the cost of goat milk to zero through self-production by promoting rearing of dairy goats to supply households with milk. The model assumes provision of dairy goats and training to very poor households at the initial stage of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the food habits nutritious diet significantly to 122,700 PKR leaving an 11 per cent gap for very poor households (Figure 3.9.2). The model assumes this gap could be filled by additional income generated from sale of part of the produce.

Figure 7.1.2: Loralai agriculture zone: Affordability of EO, NUT and FHAB with dairy goat farming



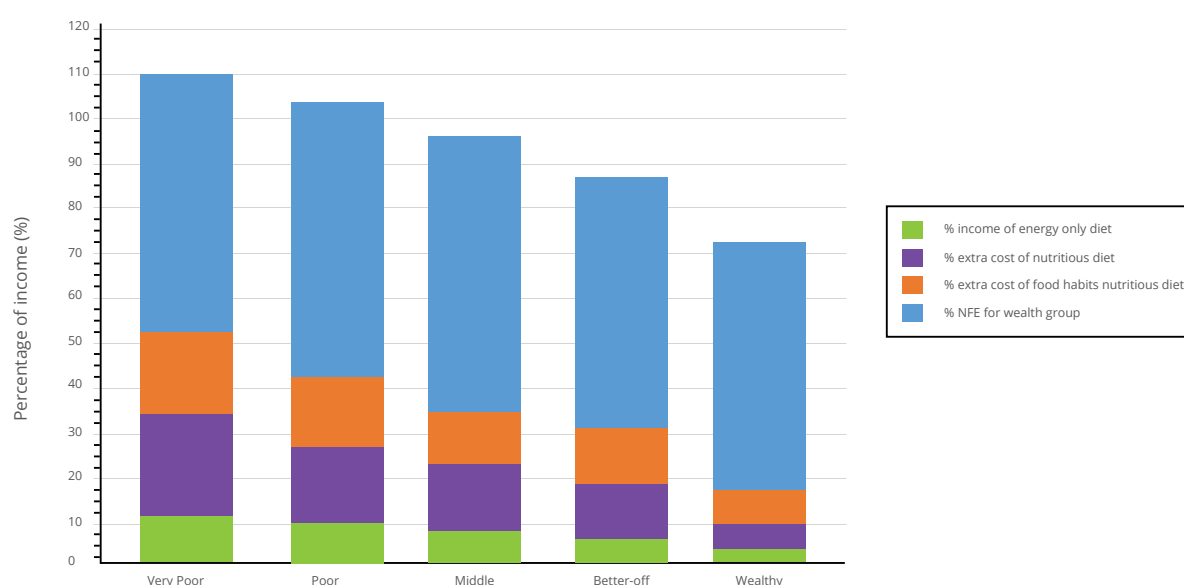
<sup>10</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 162,000 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced to 139,800 PKR, which is affordable for poor and middle households, and leaves only a 10 per cent affordability gap for very poor households (Figure 7.1.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 7.1.3: Loralai agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



#### 7.1.12 Key findings

##### The FHAB diet is approximately four times as expensive as a diet that only meets energy requirements.

The results indicate that the NUT diet is 2.8 times as expensive as the EO diet, meaning that it costs 2.8 times as much money to meet protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is four times as expensive as the EO diet and 1.4 times as expensive as the NUT diet which does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

##### In a nutritious diet, sorghum (raw) provides most of the essential micronutrients in the agriculture livelihood zone of Loralai district.

The NUT diet, that does not consider local food habits, is hypothetical but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software included sorghum (raw) which is not included in the FHAB diet. This is included as a locally-available inexpensive source of energy, protein, vitamin B1,



vitamin B2, vitamin B6, iron and zinc contributing most of these nutrients. However, FGD participants said it is not consumed in their community.

### **Vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software only reached about 100 per cent of the RNI for vitamin B12 and calcium in the NUT diet. Thus, while the software found a solution, these nutrients which only just reached 100 per cent are the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.

The software has identified that the RNIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the NUT diet are available in almost all markets visited and are therefore considered to be available in Loralai's agriculture livelihood zone. FGD participants also confirmed access to a variety of food in the market that is limited only by economic capacity and seasonality. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of total annual household income, non- food expenditure and the annual cost of the three diets indicates that very poor, poor and middle households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food types such as beef, and pulses such as beans, are believed to be not good for pregnant women as they are believed to harm the foetus. Yogurt is also believed to decrease breastmilk production and therefore cannot be given to lactating mothers.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of the child aged 12–23 months.

## **7.1.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and levels of income.
- Lactating mothers are the most expensive members of the family because of their increased requirements energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as sorghum (raw).

## Recommendations

### **Dietary modification is needed to improve quality, composition and affordability of nutritious diets.**

The CoD analysis indicates that sorghum (raw) is an important source of micronutrients such as vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc at minimum cost. This food, however, is not frequently consumed and therefore not included in the FHAB diet. Promoting its frequent consumption through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care required by lactating mothers in terms of increasing the amount, frequency and variety of foods.

### **Promoting dairy goat farming can help improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The model promoting dairy goat farming can also lower the annual cost of the FHAB diet, narrowing the affordability gap for very poor and poor households. It also increases income, further improving affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis shows that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 27 per cent for very poor and 17 per cent for poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes would allow them to purchase a variety of foods from the local market and enable them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## 7.2 Naseerabad district, agriculture livelihood zone

### 7.2.1 Market survey to collect price data

Surveys were conducted in the following six villages: Beedar, Daulat Ghari, Jhudair Shumali, Manjho Shori, Quba Sher Khan and Shori Darabi. The reference year selected for data collection was 16 February 2017 to 15 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 November 2017 to 15 February 2018
- Season 2 (Autumn): 1 August 2017 to 31 October 2017
- Season 3 (Summer): 1 May 2017 to 31 July 2017
- Season 4 (Spring): 16 February 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.10.

### 7.2.2 Availability of foods in the local markets

The data collection team found 118 foods in the markets of the six villages of the agriculture livelihood zone in Naseerabad district:

- 19 types of grains and grain-based products,
- 6 types of roots and tubers,
- 12 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 2 varieties of fish and seafoods,
- 2 varieties of eggs,
- 4 types of milk and milk products,
- 13 types of vegetables,
- 18 types of fruits,
- 5 types of fats/oils,
- 10 types of sugars and confectionary,
- 18 varieties of herbs, spices and condiments including salt,
- 4 types of beverages, and
- 1 composite dish.

### 7.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten daily. Most of the women said they produce wheat and some vegetables in their farms. They also said that almost everyone in the village keeps animals such as buffalos, cows and goats, and get milk from their own production.

All the women in the FGDs said no special foods are given to pregnant women or lactating mothers, who typically they eat whatever the whole family routinely eats. They mentioned that heavy foods such as beef and eggs are not considered to be good for pregnant women. Some pulses such as kidney beans are believed to cause constipation in the baby and are therefore not given to breastfeeding mothers.

Children aged 6–23 months are mostly fed on potatoes, milk and biscuits. Spicy foods are believed not to be healthy for these children.

People suffering from illness are given soups that are not spicy and are made from vegetables or chicken to facilitate recovery.

Nearly all the FGD participants in the six villages stated that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

## 7.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 7.2.1).

Table 7.2.1: Naseerabad agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	156.16
Macronutrients diet (MAC)	Yes	5	3	162.45
Nutritious diet (NUT)	Yes	14	8	349.66
Food habits nutritious diet (FHAB)	Yes	21	11	456.27

\* Averaged across seasons.

## 7.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 155.91 PKR and 156.35 PKR per day depending on the season. It features only two of the 118 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 57,000 PKR (Annex 3.1-10).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key food in the EO diet selected by the software is wheat flour (white and refined).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely on it for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Naseerabad's agriculture livelihood zone across all seasons, RNIs for fat, vitamins including vitamin A,

vitamin B1, vitamin B2, vitamin B6, folic acid, vitamin B12 and vitamin C, and minerals including calcium and iron, are not met by this diet (Annex 3.2-10).

### 7.2.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 349.36–349.89 PKR per day, depending on the season. Lactating mothers are the most expensive family members (Annex 3.3-10).

The NUT diet includes 13 of the 118 foods known to be eaten by people in the agriculture zone of Naseerabad district; however, some of these foods would have to be eaten in large quantities, i.e. three times daily, which is impractical. Wheat flour (brown, wholegrain raw) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Additionally, goat milk provides vitamin B12 and calcium, and vegetable ghee provides fat (Table 7.2.2).

Sorghum was also included as a locally-available and inexpensive source of energy, protein, vitamin B1 and iron, however it is typically not eaten in this district as it is used here for animal feed.

Table 7.2.2: Naseerabad agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	800	31.7	30770	24.1	49.7	51.3	12.3	0.1	0.0	72.8	46.6	63.1	58.5	16.1	0.0	16.1	49.6	61.8
Wheat, flour, white	88	3.5	3216	2.5	5.7	5.3	1.1	0.0	0.0	2.1	1.6	4.4	1.6	1.2	0.0	0.4	4.2	3.5
Baking powder	6	0.2	8394	6.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.6	0.0	0.0
Breastmilk	194	7.7	0	0.0	2.3	1.2	5.6	3.9	5.5	0.8	2.3	1.1	0.3	1.1	3.4	2.1	0.0	0.6
Milk, goat	453	18.0	37738	29.6	5.7	9.1	13.8	5.7	3.9	4.1	13.8	5.8	3.7	0.3	74.8	26.6	2.4	3.5
Ghee, vegetable	70	2.8	8604	6.7	11.6	0.0	51.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1
Coriander leaf, raw	12	0.5	411	0.3	0.1	0.2	0.0	0.6	9.2	0.1	0.2	0.2	0.3	0.5	0.0	0.8	0.2	0.1
Sorghum, raw	249	9.9	10187	8.0	16.2	14.3	6.1	0.0	0.0	9.7	11.1	9.3	11.2	3.5	0.0	2.4	18.3	10.2
Millet, pearl, local	7	0.3	448	0.4	0.5	0.5	0.3	0.0	0.0	0.4	0.6	0.5	0.4	0.2	0.0	0.1	0.8	0.6
Fish, mrigal carp, eyes included, raw	18	0.7	6021	4.7	0.3	1.9	0.4	0.1	0.0	0.2	0.5	0.2	0.8	0.2	11.0	4.5	2.0	0.1
Egg, chicken, farmed, raw	23	0.9	5654	4.4	0.6	1.9	1.5	1.5	0.0	0.8	3.1	1.0	0.6	0.8	10.6	0.0	2.2	1.4
Spinach, raw	543	21.5	12938	10.1	2.6	9.2	1.9	88.1	81.5	3.0	16.8	9.7	19.0	73.0	0.0	18.8	15.4	12.4
Mustard, seeds	19	0.8	1657	1.3	1.8	2.4	5.0	0.0	0.0	2.4	1.7	2.0	1.3	2.1	0.0	1.9	2.2	2.9
Wheat, flour, brown, whole (Wheat, whole, raw)	40	1.6	1587	1.2	2.5	2.5	0.8	0.0	0.0	3.6	1.6	2.8	2.1	1.0	0.0	0.6	2.5	2.8
Total	2521	100	127625	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	205	100	166	127	197	104	222	173	155	100	100	111	240

The percentage of target met is an average of the % nutrient requirements met over the year.



The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for a typical family in Naseerabad's agriculture livelihood zone are given in Annex 3.4-10. These show that foods available in local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, only about 100 per cent of the RNIs of vitamin B2, vitamin B12, calcium and iron is met, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 7.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Naseerabad but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 455.57–457.93 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-10).

Table 5.2.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Naseerabad's agriculture livelihood zone district.

Twenty of the 118 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software for this diet, wheat flour (brown, wholegrain, raw) is an important source of protein, energy, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, providing most of these nutrients. Additionally, spinach is an important source of vitamin A, vitamin C and folic acid, vegetable ghee of fat, and goat milk of vitamin B12 and calcium.

Table 7.2.3: Naseerabad agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	326	10.2	12 536	7.5	20.3	20.4	5.0	0.0	0.0	27.0	16.8	21.9	21.7	4.9	0.0	6.3	19.9	23.7
Breastmilk	194	6.1	0	0.0	2.3	1.1	5.6	2.8	3.3	0.7	2.1	0.9	0.3	0.9	3.3	2.0	0.0	0.6
Milk, goat	463	14.5	38 582	23.2	5.9	9.1	14.0	4.2	2.4	3.8	12.5	5.1	3.5	0.2	74.9	26.1	2.4	3.3
Sugar, white	39	1.2	2 103	1.3	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1
Cookies (bakery)	11	0.3	2 854	1.7	0.9	0.3	1.6	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.2	0.1	1.8	0.1
Ghee, vegetable	46	1.4	5 665	3.4	7.7	0.0	33.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Egg, chicken, domestic, cooked	42	1.3	11 995	7.2	1.4	3.5	4.0	2.7	0.0	1.2	4.5	1.8	0.9	1.0	19.1	1.0	4.9	2.2
Coriander leaf, raw	13	0.4	436	0.3	0.1	0.2	0.1	0.5	5.9	0.1	0.2	0.2	0.3	0.4	0.0	0.8	0.2	0.1
Ghee, cow	4	0.1	567	0.3	0.7	0.0	3.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Horse radish	124	3.9	3 063	1.8	0.8	1.3	0.3	1.2	5.3	1.5	3.8	1.3	1.2	2.1	0.0	2.1	2.0	1.2
Cumin, seeds	1	0.0	1 352	0.8	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.4	0.6	0.1
Salt	3	0.1	45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Egg, chicken, farmed, raw	5	0.2	1 277	0.8	0.1	0.4	0.3	0.2	0.0	0.2	0.6	0.2	0.1	0.1	2.4	0.0	0.5	0.3
Onion	424	13.2	18 460	11.1	3.5	3.3	0.6	0.0	9.1	2.9	2.6	2.5	9.0	3.3	0.0	3.5	1.1	2.0
Spinach, raw	731	22.8	17 425	10.5	3.5	12.1	2.6	86.0	66.7	3.7	19.9	11.1	23.3	73.3	0.0	24.3	20.4	15.7
Chilli, red, dry	6	0.2	4 231	2.5	0.4	0.6	0.3	1.4	1.3	1.0	0.8	0.6	2.6	0.4	0.0	0.4	0.2	0.4
Sugar, brown	6	0.2	372	0.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0
Tamarind, pulp, sweet, ripe	121	3.8	6 503	3.9	6.1	2.2	0.4	0.0	5.8	7.2	4.5	2.4	0.7	0.0	0.0	5.7	6.0	0.3
Sesame, seeds, whole, dried	52	1.6	15 250	9.2	5.4	5.1	17.5	0.0	0.0	6.9	5.4	6.9	6.6	2.6	0.0	18.7	6.8	9.6
Wheat, flour, brown, whole (Wheat, whole, raw)	350	10.9	14 095	8.5	22.4	21.9	7.4	0.0	0.0	29.0	12.2	20.8	17.2	6.9	0.0	5.3	21.3	23.4
Wheat, local or hyv	241	7.5	9 730	5.8	15.2	18.3	3.4	0.0	0.0	14.6	13.9	24.1	12.2	3.9	0.0	3.0	11.7	16.8
Total	3 200	100	166 540	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met																		

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI is just reached for energy, fat, vitamin B12 and calcium for the CoD family in all seasons of the year. Intake of all other nutrients significantly exceeds 100 per cent of RNI and there is no nutrient that is difficult to obtain from foods found in the local markets of the six villages of Naseerabad's agriculture livelihood zone (Annex 3.6-10).

## 7.2.8 Seasonal fluctuations in the food habits nutritious diet

There is no seasonal fluctuation in the daily cost of the FHAB diet.

## 7.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Milk and milk products, followed by grains and grain-based products and vegetables and vegetable products, are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Naseerabad district (Annex 3.7-10). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost, and yet are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients.

In the FHAB diet for the child aged 12-23 months, it is important to note the significant contribution of breastmilk to nutrient requirements: 38 per cent of energy needs, 21 per cent of protein, 68 per cent of fat, 27 per cent of vitamin A, 30 per cent of vitamin B2, 57 per cent of vitamin B12, 33 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Spinach and wheat flour (brown, wholegrain, raw) were selected by the software as important sources of iron.

## 7.2.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimated based on multiple assumptions and variable parameters. Table 7.2.4 shows the estimated affordability of the diets per year if the non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households, while even the NUT diet is not affordable for very poor and poor households.

Table 7.2.4: Naseerabad agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

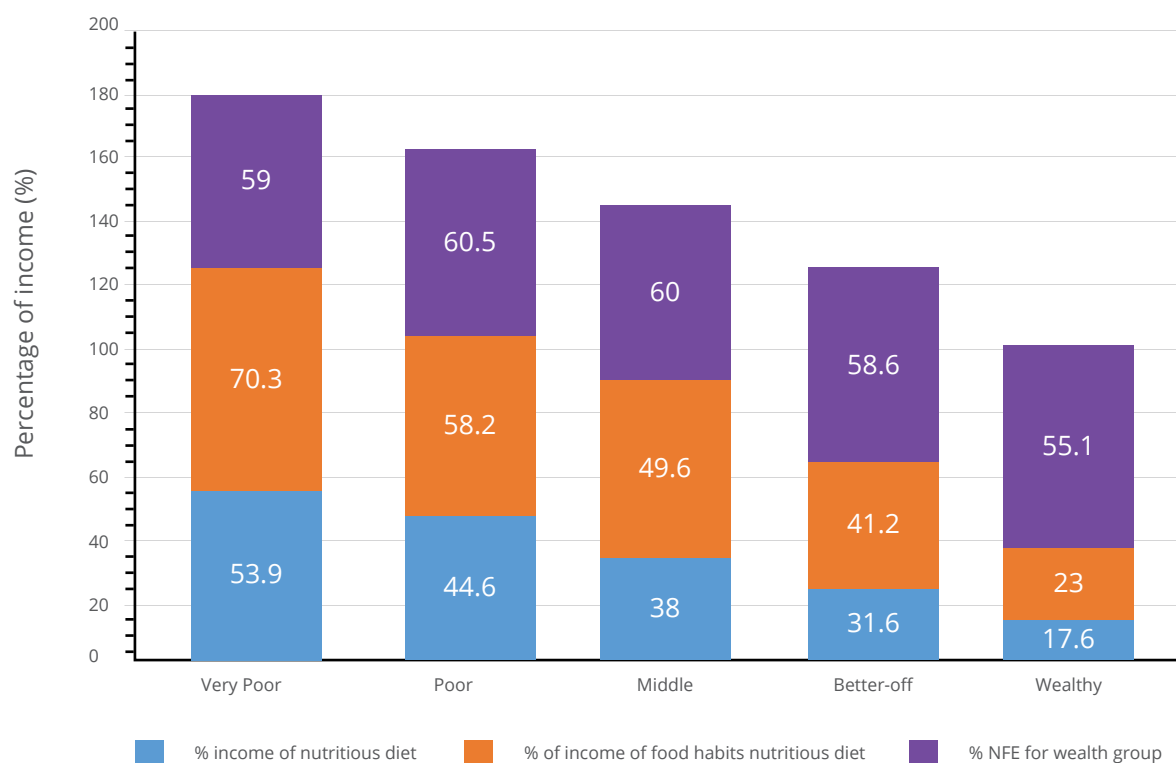
Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	127,625	53.9	166,540	70.3	139,830	59.0
Poor	285,912	127,625	44.6	166,540	58.2	172,927	60.5
Middle	336,240	127,625	38	166,540	49.6	201,890	60.0
Better-off	404,016	127,625	31.6	166,540	41.2	236,908	58.6
Wealthy	725,412	127,625	17.6	166,540	23	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 7.2.1 visually represents the affordability analysis for the five wealth groups in Naseerabad's agriculture livelihood zone based upon the numbers presented in Table 7.2.4 above. The results show that better-off and wealthy households can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. However, very poor, poor and middle households cannot, with an affordability

gap expressed as a percentage of income of 29 per cent, 19 per cent and 10 per cent respectively. The additional amount of money they require per year to afford a FHAB diet plus non-food expenditure is 69,466 PKR, 53,555 PKR and 32,190 PKR respectively.

Figure 7.2.1: Naseerabad agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 7.2.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

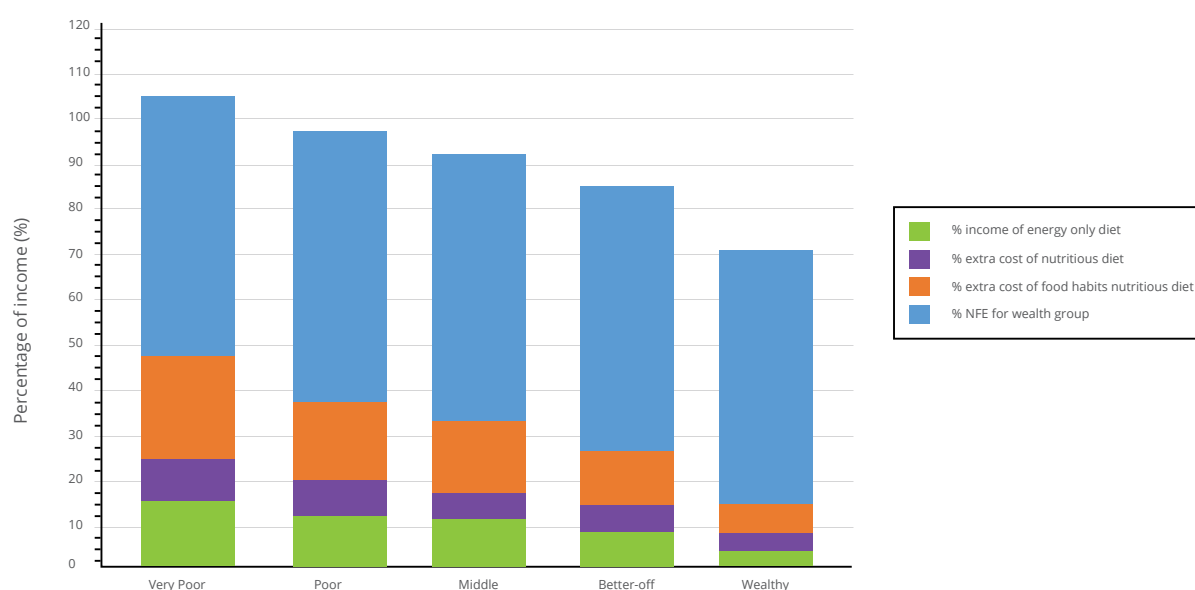
Availability of foods is not a challenge in Naseerabad district and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis finds that the affordability gap for a nutritious diet for very poor and poor households is 29 per cent and 19 per cent of income, respectively. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>11</sup> Activities could be identified through district-specific household economic approach studies.

<sup>11</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

## Model 2. The impact of dairy goat farming on the cost, quality, composition and affordability of a FHAB diet.

The software identified milk and milk products to be the most expensive food group in the FHAB diet. Most of the total cost, about 23 per cent, comes from goat milk, which is an important source of vitamin B12 and calcium, contributing most of this nutrients in the diet. This model brings down the cost of goat milk to zero to simulate self-production by promoting the rearing of dairy goats to supply households with milk. The model assumes provision of dairy goats and training to poor and very poor households at the initial stage of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet significantly to 109,000 PKR leaving only a 5 per cent gap for very poor households (Figure 3.10.2). The model assumes this gap could be filled by additional income generated from sale of part of the produce.

Figure 7.2.2: Naseerabad agriculture zone: Affordability of EO, NUT and FHAB diets with dairy goat farming

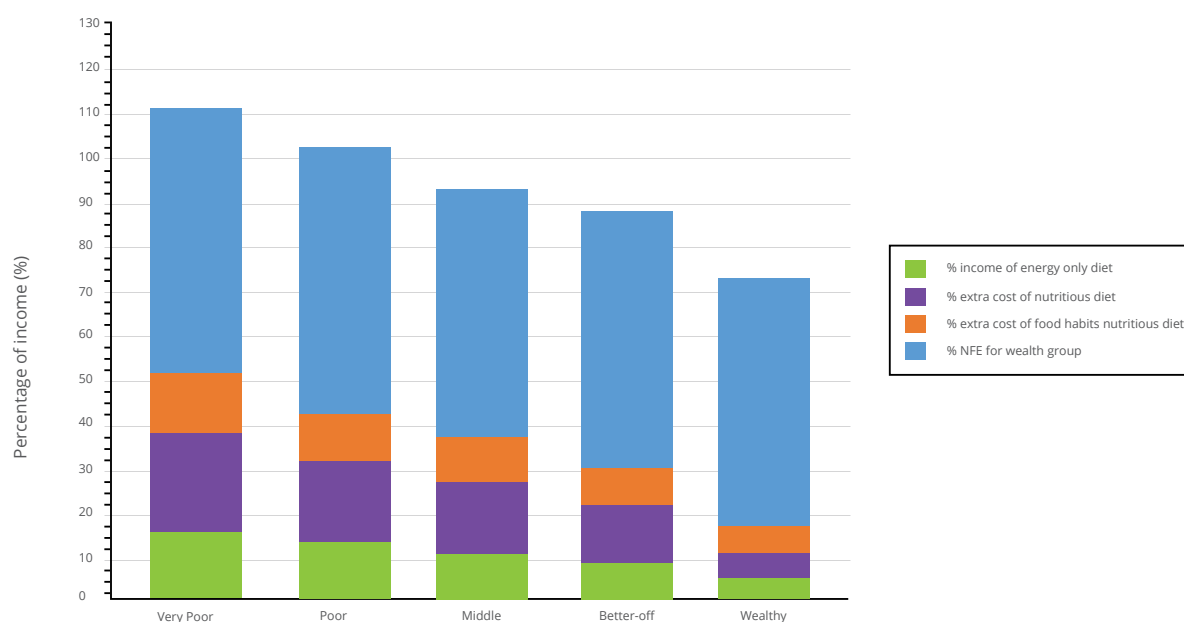


## Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment finds the annual cost of the FHAB diet for a family of seven to be 166,500 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced to 122,300 PKR, which is affordable for poor and middle households, and leaves an 11 per cent gap for very poor households (Figure 7.2.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 7.2.3: Naseerabad agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 7.2.12 Key findings

**The FHAB diet is approximately thrice as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet is 2.2 times as expensive as the EO diet, meaning that it costs 2.2 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is three times as expensive as the EO diet and 1.3 times more expensive than the nutritious diet which does not consider food habits. This means that the constraints applied to reflect dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, sorghum (raw) is the second-most important source of essential micronutrients in the agriculture livelihood zone of Naseerabad district.**

The NUT diet does not consider local food habits and is thus hypothetical, but it gives an indication of which foods found on the local market are the least expensive and most nutritious. An important food item in this is sorghum (raw), which is not usually eaten and is thus not included in the FHAB diet. Following wheat (brown, wholegrain) this is included in the NUT diet as a locally-available and inexpensive source of energy, protein, vitamin B1 and iron.

**Vitamin B2, vitamin B12, calcium and iron are the hardest nutrients for the software to meet using locally-available foods.**

The software only just met the RDI for vitamin B2, vitamin B12, calcium and iron in the NUT diet. While the software found a solution, these nutrients are the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

**The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has shown that the RDIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for a nutritious diet are all available



in almost all markets visited and are therefore considered to be available in the agriculture livelihood zone of Naseerabad district. FGD participants also confirmed that a variety of food is available in the market, and are limited by economic capacity and seasonality. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of the total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor, poor and middle households cannot afford the FHBA diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos and therefore selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food types, which are described as heavy, such as beef and eggs, are not given to pregnant women. Kidney beans are believed to cause constipation in the baby and are not given to breastfeeding mothers.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk provides a significant proportion of the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **7.2.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHBA diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Some food taboos are reported which indicates that interventions based on food or nutrients alone are insufficient to ensure a nutritious diet.

### **Recommendations**

#### **Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.**

The CoD analysis indicates that sorghum (raw) is an important source of energy, protein and micronutrients such as vitamin B1 and iron at minimum cost. This food, however, is not frequently consumed and is therefore excluded from the FHAB diet. Promoting the frequent consumption of sorghum through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care lactating mothers require in terms of increasing the amount, frequency and variety of foods.

#### **Promoting dairy goat farming can help improve quality, composition and affordability of a nutritious diet.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that

promoting dairy goat farming can lower the annual cost of the FHAB diet, narrowing the affordability gap for very poor and poor households. It also increases income and thus further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. CoD modelling indicates that at current levels of income, even very poor households can afford a nutritious diet if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of a nutritious diet.**

The affordability gap for the FHAB diet is 29 per cent and 19 per cent of income for very poor and poor households respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes would allow these households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.







# Cost of the Diet Analysis in Sindh Province

## 08.

## Cost of the Diet Analysis in Sindh Province

### 8.1 Jacobabad district, agriculture livelihood zone

#### 8.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Jaccobabad, Khudabad, Miranpur, Qadirpur, Alanpur and Ramzanpur. The reference year selected for data collection was from 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 November 2017 to 28 February 2018
- Season 2 (Autumn): 1 October 2017 to 15 November 2017
- Season 3 (Summer): 16 April 2017 to 30 September 2017
- Season 4 (Spring): 1 March 2017 to 15 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item, can be found in Annex 1.11.

#### 8.1.2 Availability of foods in the local markets

The data collection team found 116 foods in the markets of the six villages of the agriculture livelihood zone in Jacobabad district:

- 14 types of grains and grain-based products,
- 8 types of roots and tubers,
- 11 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 1 variety of fish and seafoods,
- 2 varieties of eggs,
- 2 types of milk and milk products,
- 15 types of vegetables,
- 14 types of fruits,
- 8 types of fats/oils,
- 11 types of sugars and confectionary,
- 19 varieties of herbs, spices and condiments including salt, and
- 7 types of beverages.

#### 8.1.3 Typical food consumption habits and food taboos

The interviews and FGDs found that wheat is widely consumed and is the staple food in the assessment area. Wheat is also locally produced. Millet was said to be consumed by some people but corn was said to never be consumed.

The consumption of vegetables was reported to vary depending on the season. Tomatoes and potatoes are widely consumed. Households also consume a substantial amount of buffalo milk while goat's milk is seldom used.

All the women in the FGDs said special foods are prepared for pregnant women and lactating mothers depending on economic capacity. Both pregnant women and lactating mothers were generally said to be given fruits such as apple and mango and to drink milk. Some emphasized the quantity of food to be given to lactating mothers because of breastmilk production. Some local foods such as paya (trotters) are avoided by pregnant women as they are believed to be "hot" in effect and to cause damage to the foetus. Okra was also said to have fibre that is believed to harm the foetus. Okra and cauliflower are believed to cause abdominal upset in the child and are therefore restricted for lactating mothers.

Children aged 6–23 months are mostly fed soft foods such as boiled eggs, potatoes, soft rice and milk along with cereals. Vegetables with chillies were said to cause harm to a child's stomach and are not given to children.

People suffering from illness are given soft and less spicy foods such as rice, chicken and fish.

All the FGD participants in the six villages acknowledged that a variety of foods is available in the markets although some are seasonal, especially fruits and vegetables, and some are costly. Participants are from farming households and said they get grains such as wheat from their own farms.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above were not consumed because of the local dietary habits.

#### 8.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 8.1.1).

Table 8.1.1: Jacobabad agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	143.06
Macronutrients diet (MAC)	Yes	4	3	145.45
Nutritious diet (NUT)	Yes	14	7	362.99
Food habits nutritious diet (FHAB)	Yes	23	11	558.29

\* Averaged across seasons.

#### 8.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to be 140.95–148.72 PKR per day depending on the season. It features just one of the 104 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 52,200 PKR (Annex 3.1-11).



It should be noted that the cost of the diet of a child aged 12–23 months only includes solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day.

The key foods in the EO diet as selected by the software are wheat flour (brown, whole) and millet (pearl, local).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote the diet as people who are feeding on these diets for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, when other diets are calculated. The RNIs for fat, vitamins including vitamin A, pantothenic acid, folic acid, vitamin B12 and vitamin C, and minerals including calcium, are not met by this diet (Annex 3.2-11).

### 8.1.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 334.08–391.86 PKR per day, depending on the season. Lactating mothers are the most expensive family members (Annex 3.3-11).

The NUT diet includes 13 of the 116 foods known to be eaten by people in the agriculture zone of Jacobabad district; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Millet (pearl, local) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive and rich source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Additionally, ghee (cow) was selected to provide fat; egg (chicken) to provide vitamin B12, and baking powder to provide calcium (Table 8.1.2).

Table 8.1.2: Jacobabad agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Baking powder	16	0.8	8 661	6.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.7	0.0	0.0
Breastmilk	194	9.6	0	0.0	2.3	1.1	5.5	5.9	7.0	0.9	1.9	1.1	0.4	1.7	3.4	2.1	0.0	0.5
Coconut, dried	6	0.3	714	0.5	0.7	0.2	2.7	0.0	0.3	0.2	0.1	0.2	0.1	0.3	0.0	0.1	0.2	0.3
Cucumber, raw	94	4.7	993	0.7	0.2	0.4	0.1	0.6	4.2	0.4	0.5	0.3	0.9	1.3	0.0	0.5	0.3	0.4
Ghee, cow	47	2.3	5 697	4.3	7.9	0.0	34.3	18.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.4	0.0
Salt	2	0.1	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millet, pearl, local	820	40.7	27 130	20.5	55.1	52.1	29.9	5.0	0.0	45.3	53.9	57.1	53.9	27.2	0.0	13.3	60.6	57.0
Egg, chicken, farmed, raw	206	10.2	61 691	46.6	5.3	16.3	13.5	20.8	0.0	8.0	23.5	8.8	7.0	10.7	96.5	0.0	14.6	10.9
Spinach, raw	193	9.6	8 004	6.0	0.9	3.1	0.7	48.2	36.6	1.2	5.0	3.4	8.5	38.8	0.0	6.7	4.0	3.9
Guava, green	24	1.2	1 434	1.1	0.3	0.1	0.1	0.5	49.5	1.1	0.6	0.4	0.6	1.2	0.0	0.2	0.1	0.2
Mustard, seeds	19	1.0	1 318	1.0	1.8	2.3	5.0	0.0	0.0	2.7	1.4	2.0	1.7	3.1	0.0	1.9	1.6	2.6
Watermelon, ripe	8	0.4	155	0.1	0.0	0.0	0.0	0.1	1.7	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Bay leaf, dried	1	0.1	586	0.4	0.1	0.1	0.1	0.3	0.6	0.0	0.2	0.1	0.5	0.3	0.0	0.4	0.5	0.1
Wheat, flour, brown, whole (Wheat, whole, raw)	387	19.2	16 085	12.1	24.8	23.8	8.2	0.1	0.0	40.2	12.7	26.7	26.3	15.3	0.0	6.1	17.5	24.2
Total	2 016	100	132 492	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	213	101	108	100	172	124	224	137	103	100	100	152	274

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in the Jacobabad agriculture livelihood zone are indicated in Annex 3.4-11. These show that foods available in local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin C, vitamin B12, calcium and pantothenic acid are only met to 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 8.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Jacobabad but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using all foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 511.36–642.13 PKR per day. Lactating mothers are the most expensive of the family members (Annex 3.5-11).

Table 8.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Jacobabad district's agriculture livelihood zone.

Twenty-two of the 116 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat (brown, wholegrain, raw) is an important source of protein, energy, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides most of these nutrients. Spinach is an important source of vitamin A, folic acid and vitamin C. Egg (chicken) is an important source of vitamin B12, providing most of this nutrient in the diet. Baking powder is an important source of calcium, providing most of this nutrient, and ghee (cow) is an important source of fat.

Table 8.1.3: Jacobabad agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	262	10.3	14 350	7.0	16.3	16.4	3.6	0.0	0.0	25.0	15.4	18.9	21.3	6.9	0.0	5.3	16.2	20.2
Wheat, flour, white	146	5.7	7 311	3.6	9.4	8.6	1.6	0.0	0.0	3.7	2.7	6.7	2.9	2.6	0.0	0.7	7.0	5.8
Baking powder	14	0.6	7 898	3.9	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.6	0.0	0.0
Breastmilk	194	7.6	0	0.0	2.3	1.1	5.0	4.4	6.0	0.8	2.3	1.0	0.4	1.5	3.2	2.1	0.0	0.6
Coconut, dried	9	0.4	1 160	0.6	1.2	0.3	4.1	0.0	0.4	0.3	0.1	0.2	0.2	0.4	0.0	0.1	0.6	0.5
Cookies (bakery)	11	0.4	2 894	1.4	1.0	0.3	1.5	0.1	0.0	0.1	0.2	0.3	0.1	0.1	0.2	0.1	1.9	0.1
Egg, chicken, domestic, cooked	18	0.7	6 986	3.4	0.6	1.5	1.5	1.8	0.0	0.6	2.2	0.8	0.5	0.7	7.8	0.5	2.1	1.0
Ghee, cow	83	3.3	10 012	4.9	13.8	0.0	54.9	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.1	0.0
Beef, mince, lean, raw	19	0.7	6 113	3.0	0.4	2.1	0.6	0.0	0.0	0.1	1.0	1.3	1.5	0.1	6.3	0.1	2.8	2.4
Turmeric, dried	3	0.1	1 427	0.7	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.1	1.0	0.1	0.0	0.2	1.2	0.3
Horseradish	27	1.0	1 332	0.7	0.2	0.3	0.1	0.4	2.0	0.4	0.9	0.3	0.3	0.8	0.0	0.5	0.4	0.3
Cumin, seeds	1	0.0	1 330	0.7	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.4	0.6	0.1
Fennel, seeds	< 1	0.0	269	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.0
Egg, chicken, farmed, raw	186	7.3	54 742	26.9	4.8	14.9	11.1	13.9	0.0	6.7	25.7	7.4	5.5	8.4	82.4	0.0	18.1	11.2
Onion	424	16.6	29 763	14.6	3.5	3.3	0.6	0.0	16.3	3.3	2.9	2.6	11.0	5.7	0.0	3.6	1.1	2.2
Spinach, raw	278	10.9	11 531	5.7	1.3	4.6	0.9	51.3	45.2	1.6	8.6	4.5	10.8	48.8	0.0	9.6	7.9	6.4
Guava, green	< 1	0.0	39	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rice, grain or flour	38	1.5	1 982	1.0	2.6	1.4	0.2	0.0	0.0	0.4	0.8	1.1	1.1	0.2	0.0	0.1	0.3	1.1
Bay leaf, dried	1	0.1	620	0.3	0.1	0.1	0.1	0.2	0.5	0.0	0.2	0.1	0.5	0.2	0.0	0.5	0.8	0.1
Sesame, seeds, whole, dried	10	0.4	2 872	1.4	1.1	1.0	3.2	0.0	0.0	1.6	1.2	1.5	1.6	0.9	0.0	3.9	1.4	2.0
Tomato, ripe	195	7.7	11 162	5.5	0.8	1.0	0.4	3.8	28.5	2.3	3.4	1.6	3.1	2.7	0.0	0.4	1.2	0.5
Wheat, flour, brown, whole (Wheat, whole, raw)	358	14.1	14 918	7.3	22.9	22.3	6.9	0.1	0.0	34.2	14.2	22.8	21.5	12.3	0.0	5.7	22.2	25.5
Wheat, local or hyv	267	10.5	15 061	7.4	16.8	20.2	3.4	0.0	0.0	18.7	17.5	28.7	16.5	7.5	0.0	3.5	13.1	19.8
Total	2 546	100	203 774	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	210	111	146	117	187	103	243	156	119	106	100	111	241

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy and calcium is only just met for the CoD family in all seasons of the year. The RNIs for all other nutrients are comfortably exceeded and there is no nutrient that is difficult to obtain from foods found in the local markets of the six villages of Jacobabad district (Annex 3.6-11).

### 8.1.8 Seasonal fluctuations in the food habits nutritious diet

There is variation in prices of foods across the four seasons: they are highest in autumn and lowest in summer.

### 8.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Eggs and egg products are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Jacobabad district (Annex 3.7-11). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost, and yet are the least expensive. In addition, they are seasonal and the cost differs between summer and the other three seasons.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to nutrient requirements: 38 per cent of total energy needs, 21 per cent of protein, 68 per cent of fat, 43 per cent of vitamin A, 35 per cent of vitamin B2, 57 per cent of vitamin B12 and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (brown, wholegrain, raw) was selected by the software as important source of iron.

### 8.1.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a nutritious diet. The gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 8.1.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the diets. The table indicates that the FHAB diet is not affordable for very poor, poor, middle and better-off households while the NUT diet is not affordable for very poor and poor households.

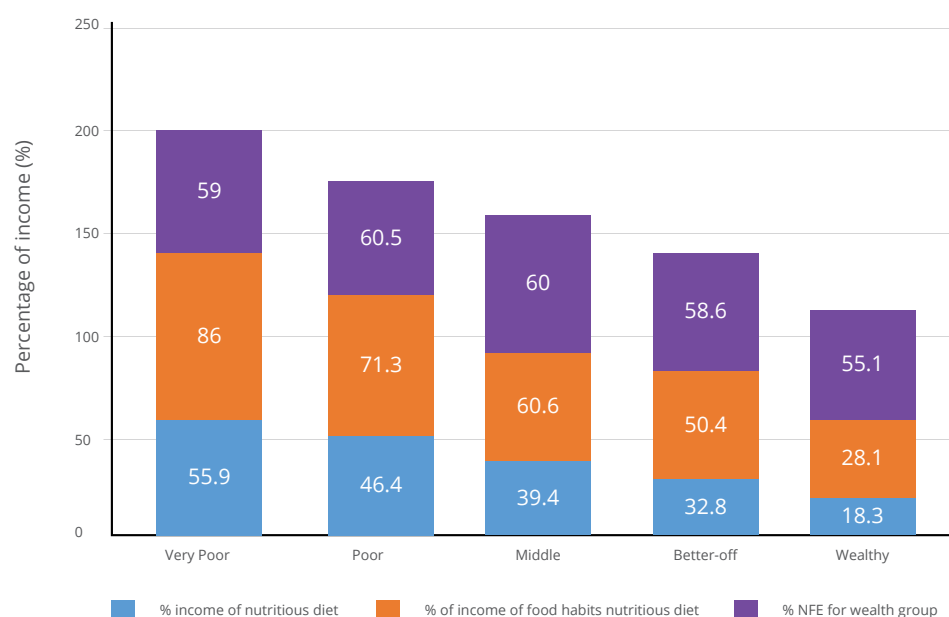
Table 8.1.4: Jacobabad agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	132	55.9	203,774	86	139,830	59.0
Poor	285,912	132	46.4	203,774	71.3	172,927	60.5
Middle	336,240	132	39.4	203,774	60.6	201,890	60.0
Better-off	404,016	132	32.8	203,774	50.4	236,908	58.6
Wealthy	725,412	132	18.3	203,774	28.1	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 8.1.1 visually represents the affordability analysis for the five wealth groups in the agriculture livelihood zone based upon the numbers presented in Table 8.1.4 above. The results show that only the wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 45 per cent for very poor, 32 per cent for poor, 21 per cent for middle and 9 per cent for better-off households. To afford a FHAB diet, these households need an additional amount of 106,700 PKR, 90,789 PKR, 69,424 PKR and 36,666 PKR respectively.

Figure 8.1.1: Jacobabad agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 8.1.11 Modelling nutritional interventions

Four interventions were modelled to examine their effects on the composition and cost of the diet:

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Jacobabad district's agriculture livelihood zone and markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is 45 per cent and 32 per cent of income, respectively. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>12</sup> Activities could be identified through district-specific household economic approach studies.

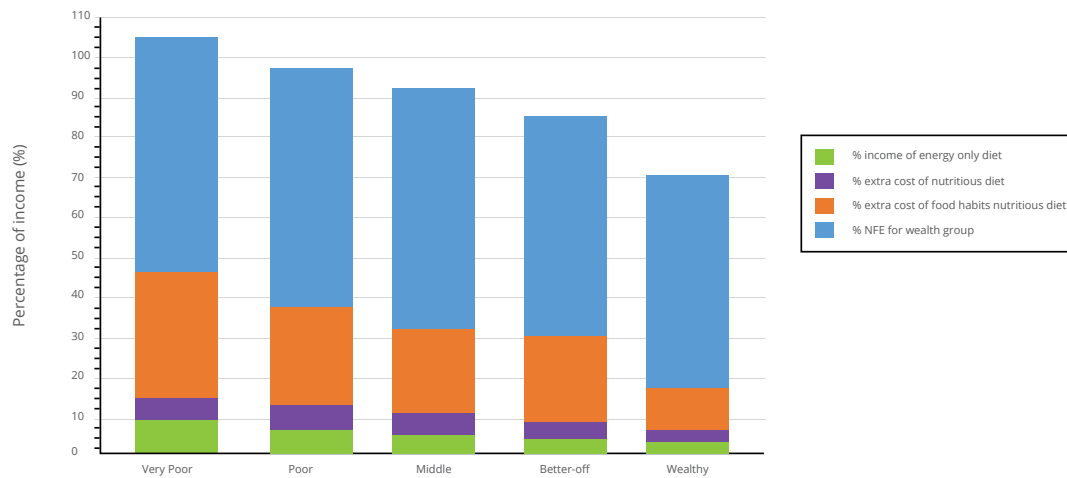
#### Model 2. The impact of poultry farming on the cost, quality, composition and affordability of a FHAB diet.

The software identified eggs and egg products to be the most expensive food groups in the FHAB diet, contributing 30.3 per cent of the annual cost of the diet. Egg is an important source of protein, vitamin B2, vitamin B12, iron and zinc. This model brings the cost of eggs to zero through self-production at the household level by promoting poultry farming for eggs. The model assumes provision of inputs such as chicks and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This brings down the annual cost of the FHAB diet significantly, to 107,479 PKR leaving only a 4 per cent gap for very poor households (Figure 8.1.2). The model assumes this gap could be filled by additional income generated from sale of part of the produce.

<sup>12</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.



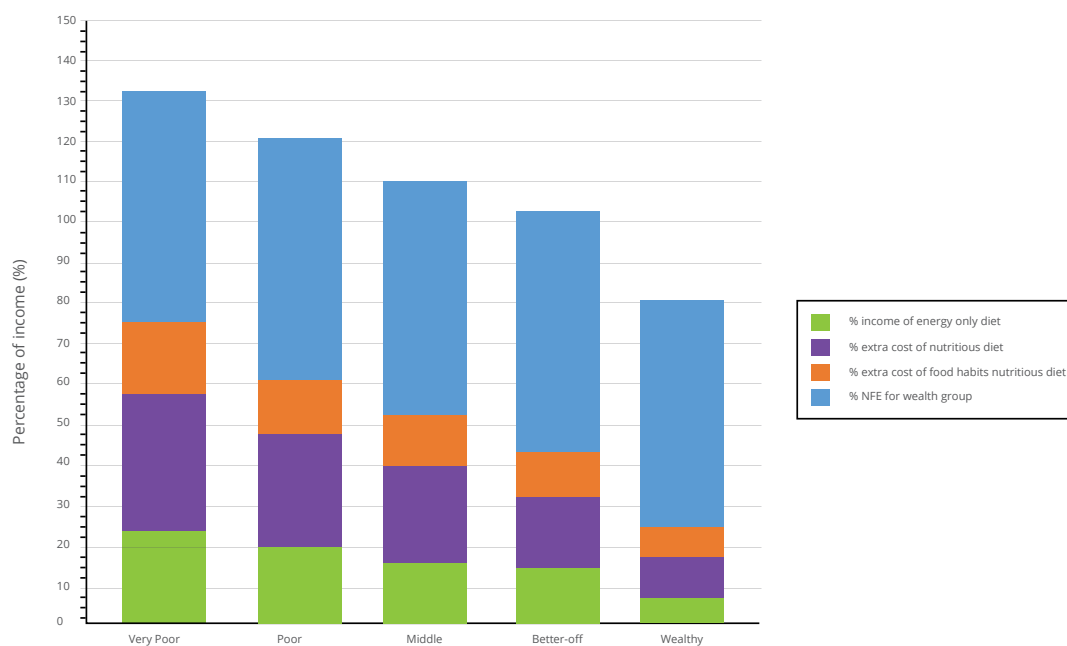
Figure 8.1.2: Jacobabad agriculture zone: Affordability of EO, NUT and FHAB with poultry farming for eggs



### Model 3. The impact of dietary modification resulting in frequent consumption of millet (pearl, local) in place of wheat on the cost, quality, composition and affordability of a FHAB diet.

In the NUT diet, millet (pearl, local) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. This model tests the impact of promoting frequent consumption of millet through social behavioural change communication on the cost, quality, composition and affordability of the FHAB diet from which millet is otherwise excluded due to existing dietary patterns. This is done by increasing the minimum and maximum constraints of millet to seven and fourteen respectively, to mimic frequent consumption and inclusion as a staple food. This lowers the cost of the FHAB diet significantly, from 203,800 PKR to 172,200 PKR narrowing the affordability gap for very poor households from 45 per cent to 32 per cent (Figure 8.1.3).

Figure 8.1.3: Jacobabad agriculture zone: Affordability of EO, NUT and FHAB diet with millet consumption

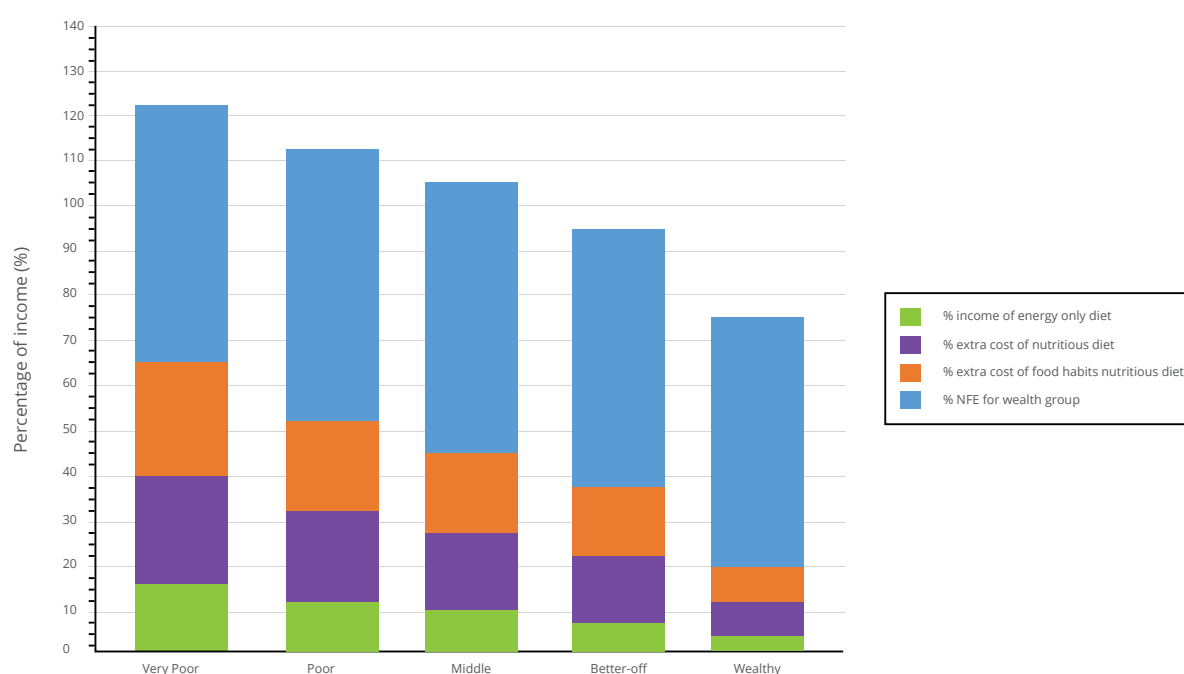


### Model 4. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 203,800 PKR, which is not affordable for very poor, poor, middle and better-off households. When the family size is reduced to five, the cost is significantly reduced to 149,800 PKR, which is still not affordable for very poor, poor and middle households. However, the affordability gap is narrowed to 22 per cent, 13 per cent and 5 per cent of income, respectively (Figure 8.1.4). A corresponding reduction in the non-food expenditure is expected which may enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 8.1.4: Jacobabad agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



#### 8.1.12 Key findings

**The food habits nutritious diet is approximately four times as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet is 2.5 times as expensive as the EO diet, meaning that it costs 2.5 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is four times as expensive as the EO diet and 1.5 times more expensive than the NUT diet which does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, millet (pearl, local) provides most of the essential micronutrients in the agriculture livelihood zone of Jacobabad district.**

The NUT diet that does not consider local food habits is hypothetical and yet gives an indication of which foods found on the local market are the least expensive and most nutritious. The software has included millet (pearl, local) as locally-available inexpensive source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc. However, it is not included in the FHAB diet and FGD participants said millet is rarely consumed.

### **Vitamin B12, vitamin C, calcium and pantothenic acid are the hardest nutrients for the software to meet using locally-available foods.**

The software reached only 100 per cent of RNI for vitamin B12, vitamin C, calcium and pantothenic acid in the NUT diet. Thus, while the software has found a solution, these nutrients are the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has shown that the recommended intakes of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the NUT diet are all available in almost all the markets visited and are therefore considered to be available in Jacobabad's agriculture livelihood zone. FGD participants also confirmed that a variety of food is available in the market, including vegetables, fruits and grains, though some vegetables were described as seasonal. Most households were said to produce wheat on their own farms. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The comparison of the total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor, poor, middle and better-off households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos and therefore selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some vegetables such as okra were reported to be avoided as they are believed to cause harm to the child.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of the child aged 12–23 months.

## **8.1.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.

- Dietary habits restrict the consumption of some nutritionally-rich and less expensive foods such as millet (pearl, local).

## Recommendations

### Dietary modification is needed to improve quality, composition and affordability of nutritious diets.

The CoD analysis indicates millet (pearl, local) is an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc. However, this food is not frequently consumed and is therefore excluded from the FHAB diet. Promoting its frequent consumption through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care required by lactating mothers in terms of increasing the amount, frequency and variety of foods.

### Promoting poultry farming can help improve quality, composition and affordability of nutritious diets.

Economic barriers are among the limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The model promoting poultry farming lowers the annual cost of the FHAB diet, narrowing the affordability gap to 4 per cent of income for the very poor. It also increases income which further improves affordability.

### Continuation of breastfeeding to two years should be promoted.

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable for very poor, poor and middle households, and will also act as a natural family planning method thereby enabling child spacing.

### Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD model clearly indicates that the affordability gap for the FHAB diet for very poor and poor households is reduced to 22 per cent and 13 per cent respectively if the family size is limited to five. It is believed that this gap could be filled with a corresponding reduction in non-food expenditure. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### Social protection schemes should be scaled up to improve affordability of nutritious diets.

The affordability gap for the FHAB diet is 45 per cent and 32 per cent for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes would allow these households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

## Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

### 8.2 Sanghar district, agriculture livelihood zone

#### 8.2.1 Market survey to collect price data

Surveys were conducted in the following six villages: Asgharabad, Barhoon, Gujral, Khabari, Mardanabad and Sinjhor. The reference year selected for data collection was 1 March 2017 to 28 February 2018. The team was asked the name and length of each season, in reverse order. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 December 2017 to 28 February 2018
- Season 2 (Autumn): 1 October 2017 to 30 November 2017
- Season 3 (Summer): 1 May 2017 to 30 September 2017
- Season 4 (Spring): 1 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.12.

#### 8.2.2 Availability of foods in the local markets

The data collection team found 134 foods in the markets of the six villages of the agriculture livelihood zone in Sanghar district:

- 17 types of grains and grain-based products,
- 8 types of roots and tubers,
- 13 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 6 varieties of fish and seafoods,
- 2 varieties of eggs,
- 5 types of milk and milk products,
- 15 types of vegetables,
- 14 types of fruits,
- 11 types of fats/oils,
- 11 types of sugars and confectionary,
- 19 varieties of herbs, spices and condiments including salt,
- 7 types of beverages, and
- 2 composite dishes.

### 8.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat (whole, brown) is the staple food in the assessment area and is eaten five or more times a week. Most of the women in the FGDs indicated they produce wheat on their own farms. Most also keep buffalos and get a large quantity of milk, and grow vegetables such as spinach. Rice was said to be expensive and not widely consumed in the area. Corn and millet were said to be not available or consumed in the area.

The women generally said no special foods are prepared for pregnant or breastfeeding mothers and they eat whatever is available. Some indicated that yogurt, milk, boiled wheat and fresh butter should be given to a lactating mother. Pulses are believed to not be good for mother and baby and are therefore not given to lactating mothers. Almond and coconut are said to be good for pregnant women while okra and cauliflower are believed to be not good and therefore are not given during pregnancy. The women indicated their preference for chicken compared to beef.

Children aged 6–23 months are mostly fed on milk and soft foods such as porridge, rice and boiled potatoes. Chips and chickpeas were reported to not be given to children of this age as they are believed to cause abdominal upset.

People suffering from illness are given fruits and milk.

All FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables. They also reported self-production of wheat, buffalo milk and vegetables which contribute significantly to their household diet and do not need to be bought from market. Economic constraints were repeatedly indicated to be the cause of poor household diets. The participants said they do not receive any support from the government.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they were available in the market, some of the foods described above are not consumed because of local dietary habits.

### 8.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 8.2.1).

Table 8.2.1. Sanghar agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	174.64
Macronutrients diet (MAC)	Yes	4	3	185.53
Nutritious diet (NUT)	Yes	12	9	303.6
Food habits nutritious diet (FHAB)	Yes	25	10	486.47

\* Averaged across seasons.



### 8.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 173.57 PKR and 176.78 PKR per day and features only two of the 134 foods found in the markets of the six villages excluding breastmilk. The annual cost of this diet for the typical family is estimated to be 63,700 PKR (Annex 3.1-12).

It should be noted that the cost of the diet for a child aged 12–23 months only includes the solid and semi-solid complementary foods the child is given. It does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key food in the EO diet selected by the software is wheat (whole, brown, flour/grain).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet as people who rely on it for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. The RNIs for fat, vitamins including vitamin A, vitamin B2, folic acid, vitamin B12 and vitamin C, and minerals including calcium, are not met by this diet (Annex 3.2-12).

### 8.2.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 296.51–312.44 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-12).

The NUT diet includes 11 of the 134 foods known to be eaten by people in the agriculture livelihood zone of Sanghar district; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat flour (whole, brown) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, folic acid, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A and provides most of this nutrient in the diet. Egg (chicken, farm) was selected as an inexpensive and rich source of vitamin B12 and provides the highest proportion of this nutrient. Additionally, ghee (cow) was selected to be an inexpensive and rich source of fat; guava (green) for vitamin C; and baking powder for calcium (Table 8.2.2).

Table 8.2.2: Sanghar agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	31	1.6	1 391	1.3	1.9	1.8	0.5	0.0	0.0	2.6	1.8	2.4	2.8	0.9	0.0	0.6	1.6	2.1
Baking powder	8	0.4	1 403	1.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.0	0.0	0.0
Breastmilk	194	10.1	0	0.0	2.3	1.1	5.6	5.9	7.0	0.7	2.4	1.0	0.4	1.7	3.4	2.0	0.0	0.5
Fish, trout (fish, Indian river shad, raw)	37	1.9	8 688	7.8	0.7	3.0	1.3	0.1	0.0	0.0	0.0	1.1	0.0	0.0	23.0	14.2	9.4	1.7
Ghee, cow	54	2.8	8 919	8.0	9.0	0.0	39.7	21.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.6	0.0
Millet, pearl, local	181	9.5	9 477	8.6	12.2	11.2	6.7	1.1	0.0	8.1	14.8	12.5	11.8	6.1	0.0	2.7	15.3	13.1
Egg, chicken, farmed, raw	128	6.7	20 507	18.5	3.3	9.8	8.5	12.8	0.0	4.0	18.2	5.4	4.3	6.8	59.9	0.0	10.4	7.0
Spinach, raw	181	9.4	8 188	7.4	0.9	2.9	0.6	45.0	34.5	0.9	5.8	3.2	7.9	37.2	0.0	5.8	4.3	3.8
Guava, green	25	1.3	1 245	1.1	0.3	0.1	0.1	0.5	52.0	0.9	0.8	0.4	0.6	1.3	0.0	0.2	0.2	0.2
Cheese, cottage	82	4.3	10 695	9.7	5.3	10.7	15.2	10.3	0.0	0.3	13.6	6.6	0.0	3.4	13.6	23.4	0.6	6.8
Bay leaf, dried	16	0.8	1 524	1.4	1.0	0.6	1.0	3.0	6.6	0.0	2.4	0.8	6.2	3.0	0.0	4.7	7.1	1.4
Wheat, flour, brown, whole (Wheat, whole, raw)	980	51.1	38 776	35.0	62.7	58.5	20.9	0.2	0.0	82.4	40.1	66.7	66.0	39.4	0.0	14.5	50.6	63.5
Total	1 917	100	110 813	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	219	100	109	100	213	100	227	139	101	100	107	133	264

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Sanghar's agriculture livelihood zone are given in Annex 3.4-12. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, the RNIs of vitamin B2, vitamin B12, folic acid and calcium are met only to about 100 per cent, suggesting that the software found these nutrients to be the hardest to meet using locally-available foods.

### 8.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Sanghar but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 480.75–491.57 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-12).

Table 8.2.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Sanghar district's agriculture livelihood zone.

Twenty-four of the 134 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat flour (brown, wholegrain) is an important source of energy, protein, vitamin B1, vitamin B2, niacin, iron and zinc, providing most of these nutrients. Additionally, ghee (cow) is an important source of fat; fenugreek (leaf) is an important source of vitamin B6, vitamin C and calcium; spinach is an important source of vitamin A and folic acid, and goat milk is an important source of vitamin B12.

Table 8.2.3: Sanghar agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	288	10.8	13 143	7.4	17.9	18.6	4.4	0.0	0.0	23.6	14.8	22.4	16.8	5.6	0.0	5.8	16.5	22.9
Breastmilk	194	7.3	0	0.0	2.3	1.2	5.6	3.1	3.3	0.7	2.1	1.1	0.3	1.1	3.4	2.1	0.0	0.6
Tea, powder	6	0.2	4 265	2.4	0.4	0.7	0.0	0.0	0.0	0.0	1.9	0.9	0.3	0.5	0.0	0.3	0.2	0.3
Milk, goat	458	17.2	41 208	23.2	5.8	9.3	13.9	4.6	2.4	3.7	12.3	5.8	3.0	0.3	75.6	26.9	2.2	3.6
Sugar, white	43	1.6	2 516	1.4	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.1
Cookies (bakery)	9	0.3	2 290	1.3	0.8	0.3	1.4	0.0	0.0	0.1	0.1	0.3	0.1	0.1	0.2	0.1	1.5	0.1
Ghee, vegetable	10	0.4	1 649	0.9	1.6	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cinnamon, ground	< 1	0.0	436	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0
Coriander leaf, raw	11	0.4	627	0.4	0.1	0.2	0.0	0.5	5.2	0.1	0.2	0.2	0.2	0.5	0.0	0.7	0.2	0.1
Ghee, cow	60	2.2	9 827	5.5	10.0	0.0	43.8	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0
Jaggery, sugarcane, solid	15	0.6	922	0.5	1.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.5	0.3	0.0
Turmeric, dried	2	0.1	1 012	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.6	0.1	0.0	0.1	0.9	0.2
Cumin, seeds	2	0.1	1 871	1.0	0.2	0.2	0.3	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.8	1.1	0.2
Grass pea, split dried, raw	4	0.2	334	0.2	0.3	0.7	0.0	0.0	0.0	0.3	0.3	0.2	0.2	0.6	0.0	0.1	0.3	0.4
Fenugreek, leaf	408	15.3	38 727	21.8	2.8	8.6	0.6	33.9	57.9	6.1	23.4	6.6	31.6	28.5	0.0	33.2	14.8	4.3
Salt	3	0.1	237	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fennel seeds	6	0.2	1 308	0.7	0.4	0.6	0.7	0.0	0.0	0.4	0.7	0.9	0.4	0.0	0.0	3.0	1.3	0.6
Milk, buffalo	7	0.3	820	0.5	0.1	0.2	0.4	0.1	0.0	0.1	0.4	0.1	0.1	0.0	0.6	0.4	0.0	0.1
Millet, pearl, flour, local	38	1.4	3 318	1.9	2.5	2.2	1.3	0.0	0.0	1.3	2.1	2.1	1.2	0.6	0.0	0.5	2.5	1.6
Egg, chicken, farmed, raw	43	1.6	7 814	4.4	1.1	3.5	2.8	2.3	0.0	1.3	5.2	1.8	0.9	1.4	20.1	0.0	3.9	2.6
Spinach, raw	312	11.7	13 550	7.6	1.5	5.3	1.1	40.8	28.4	1.6	8.5	5.5	8.7	40.7	0.0	10.8	8.2	7.3
Chilli, red, dry	6	0.2	1 676	0.9	0.4	0.6	0.3	1.6	1.3	1.0	0.8	0.7	2.3	0.5	0.0	0.4	0.2	0.4
Bay leaf, dried	6	0.2	628	0.4	0.4	0.3	0.4	0.6	1.3	0.0	0.8	0.3	1.6	0.8	0.0	2.1	3.3	0.6
Wheat, flour, brown, whole (Wheat, whole, raw)	715	26.8	28 283	15.9	45.8	45.9	15.2	0.1	0.0	58.4	24.8	48.9	30.7	18.3	0.0	11.3	41.0	52.3
Wheat, local or hyv	18	0.7	1 160	0.7	1.1	1.4	0.3	0.0	0.0	1.1	1.0	2.1	0.8	0.4	0.0	0.2	0.8	1.4
Total	2 668	100	177 561	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	204	100	206	209	219	118	226	217	160	100	100	120	234

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI is only just met for fat, vitamin B12 and calcium for the CoD family in all seasons of the year. The intake of all other nutrients significantly exceeds 100 per cent and there is no nutrient that is difficult to obtain from foods found in the local markets of the six villages of Sanghar district's agriculture livelihood zone (Annex 3.6-12).

### 8.2.8 Seasonal fluctuations in the food habits nutritious diet

The daily cost of the FHAB diet is generally stable throughout the year despite some fluctuations in the cost of specific food items.

### 8.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Vegetables and vegetable products followed by staple foods (grains and grain-based products) are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Sanghar district (Annex 3.7-12). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute most to the cost of the diet, yet are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients. The price of vegetables is lowest in winter and highest in autumn.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to nutrient requirements, providing 38 per cent of the total energy needs of the child, 69 per cent of fat, 32 per cent of vitamin A, 30 per cent of vitamin B2, 57 per cent of vitamin B12, 32 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) and fenugreek (leaf) were selected by the software as important sources of iron.

### 8.2.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimated based on multiple assumptions and variable parameters. Table 8.2.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table shows that the FHAB diet is not affordable for very poor, poor, middle and better-off households while the NUT diet is not affordable only for very poor households.

Table 8.2.4: Sanghar agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

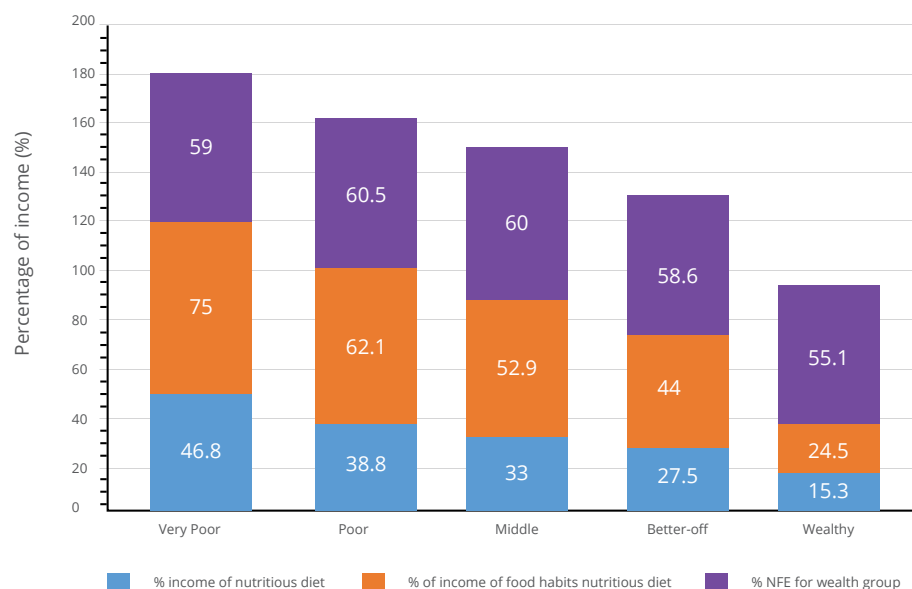
Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	110,813	46.8	177,561	75	139,830	59.0
Poor	285,912	110,813	38.8	177,561	62.1	172,927	60.5
Middle	336,240	110,813	33	177,561	52.9	201,890	60.0
Better-off	404,016	110,813	27.5	177,561	44	236,908	58.6
Wealthy	725,412	110,813	15.3	177,561	24.5	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 8.2.1 visually represents the affordability analysis for the five wealth groups in Sanghar's agriculture livelihood zone based upon the numbers presented in Table 8.2.4 above. The results show that only the wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 34 per cent for very poor, 23 per cent for poor, 13 per cent

for middle and 3 per cent for better-off households. The additional amount of money required per year to afford a FHAB diet plus non-food expenditure is 84,487 PKR, 64,576 PKR, 43,211 PKR and 10,453 PKR respectively.

Figure 8.2.1: Sanghar agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 8.2.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Sanghar district and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis finds that the affordability gap for a nutritious diet is 45 per cent of income for the very poor and 32 per cent of income for the poor. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>13</sup> Activities could be identified through district-specific household economic approach studies.

#### Model 2. The impact of self-production of vegetables in a kitchen garden on the cost, quality, composition and affordability of a FHAB diet.

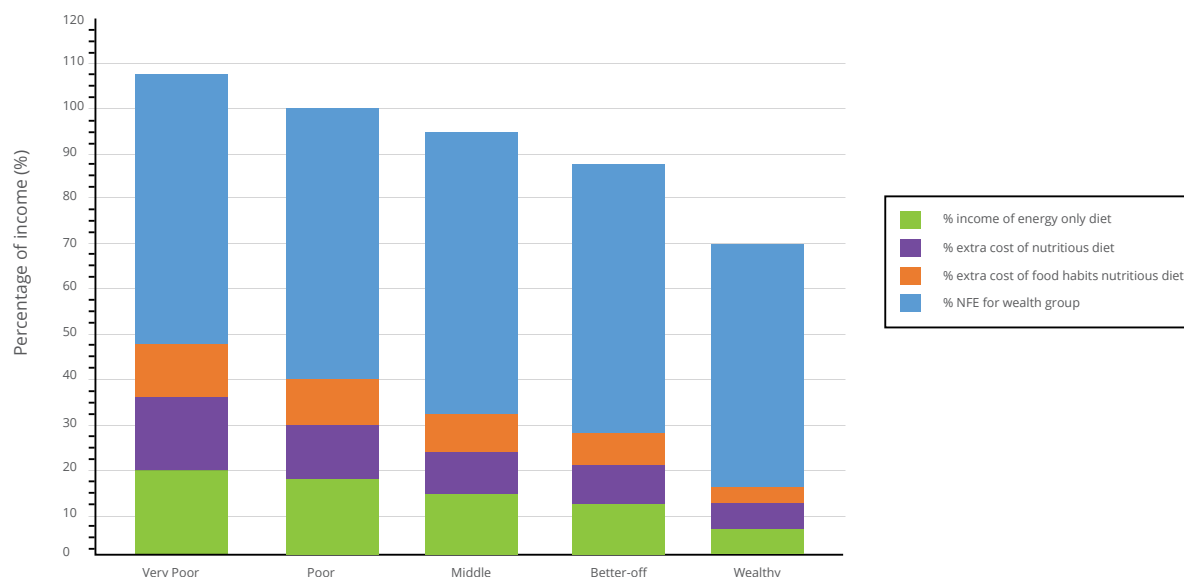
The software identified vegetables and vegetable products to be the most expensive food groups in the FHAB diet. Fenugreek (leaf) is an important source of vitamin B6, vitamin C and calcium, and spinach is an important source of vitamin A and folic, but together these two vegetables included by the software contribute 29.4 per cent of the annual cost of the diet. This model reduces this cost to zero by simulating self-production at the household level by promoting the growth of these vegetables in small kitchen gardens. The model assumes provision of inputs such as

<sup>13</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.



vegetable seeds and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 114,276 PKR. This is still not affordable for very poor households, however, it narrows the affordability gap significantly to 7 per cent. The model assumes that the additional income generated from sale of part of the produce could fill this income gap (Figure 8.2.2).

Figure 8.2.2: Sanghar agriculture zone: Affordability of EO, NUT and FHAB diets with kitchen gardening

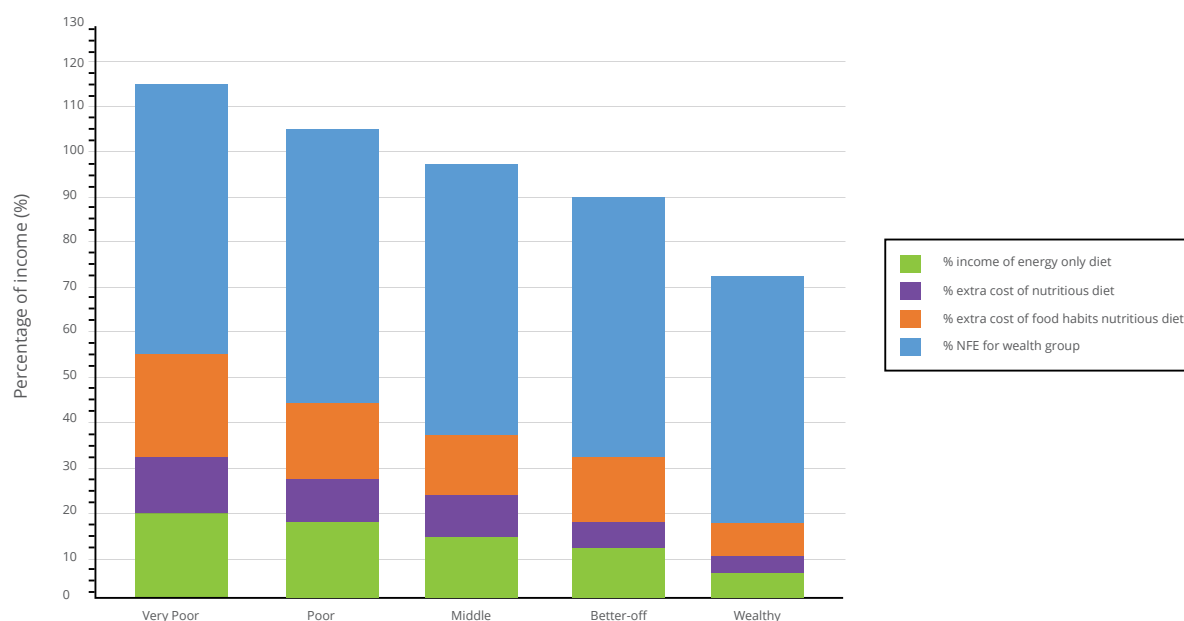


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment finds the annual cost of the FHAB diet for a family of seven to be 177,600 PKR which is not affordable for very poor, poor, middle and better-off households. When the family size is reduced to five, the cost is significantly reduced to 129,010 PKR, which is still not affordable for very poor and poor households, but narrows the gap significantly to 13 per cent and 6 per cent, respectively (Figure 8.2.3). A corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 8.2.3: Sanghar agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 8.2.12 Key findings

**The FHAB diet is approximately 2.7 times more expensive than a diet that only meets energy requirements.**

The results indicate that the NUT diet is 1.7 times as expensive as the EO diet, meaning that it costs 1.7 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is 2.7 times as expensive as the EO diet and 1.6 times more expensive than the NUT diet which does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, wheat flour (whole, brown) provides most of the essential micronutrients in Sanghar district Agriculture livelihood zone.**

The NUT diet does not consider local food habits and is thus hypothetical, but it gives an indication of which foods found on the local market are the least expensive and most nutritious. To this end, the software has included wheat flour (whole, brown) as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, folic acid, iron and zinc, and guava (green) as an inexpensive and rich source of vitamin C. Wheat is included in the FHAB diet, indicating that it is part of the staple food in the community, but guava (green) is not. FGD participants indicated wheat is locally produced, most in their own farms, and frequently consumed.

**Vitamin B2, vitamin B12, folic acid and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software only met the RNI for vitamin B2, vitamin B12, folic acid and calcium by 100 per cent in the NUT diet. Thus, while the software found a solution, these nutrients are the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

**The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has identified that the RDIs of energy, protein, fat, all the nine vitamins and the four minerals can be

met using foods available in the local market. The foods selected by the software for a nutritious diet are all available in almost all markets visited and are therefore considered to be available in the agriculture livelihood zone of Sanghar district. The FGD participants also confirmed the availability of a variety of foods in the market, and are limited by economic capacity. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The comparison of the total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor, poor, middle and better-off households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos and therefore select foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some food such as pulses are taboo for breastfeeding mothers as they believed to not be good for mother and child. Okra and cauliflower are believed to cause abdominal discomfort during pregnancy.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk provides a significant proportion of the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **8.2.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Some food taboos are reported which indicates interventions based on food or nutrients alone will be insufficient to ensure nutritious diet.

### **Recommendations**

#### **Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.**

The CoD analysis shows that guava (green) is an inexpensive and rich source of vitamin C. Promoting the frequent consumption of this food through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care lactating mothers require in terms of increasing the amount, frequency and variety of foods.

#### **Promoting self-production of vegetables can help improve quality, composition and affordability of a nutritious diet.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood

opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that self-production of vegetables in a kitchen garden can significantly lower the annual cost of the FHAB diet, narrowing the affordability gap. It also increases income and thus further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable for very poor, poor and middle households, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve the quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. CoD modelling indicates shows that at current income levels, even very poor households may be able to afford a nutritious diet if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of a nutritious diet.**

The affordability gap for the FHAB diet is 34 per cent and 23 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes would allow such households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## 8.3 Sanghar district, livestock/poultry livelihood zone

### 8.3.1 Market survey to collect price data

Surveys were conducted in the following six villages: Kumb Dharoon, Maldasi, Manik Thahim, Shuja Jakrio, Tando Adam and UC Lundo. The reference year selected for data collection was 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 December 2017 to 28 February 2018
- Season 2 (Autumn): 1 October 2017 to 30 November 2017
- Season 3 (Summer): 1 May 2017 30 September 2017
- Season 4 (Spring): 1 March 2017 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.13.

### 8.3.2 Availability of foods in the local markets

The data collection team found 134 foods in the markets of the six villages of the livestock/poultry livelihood zone in Sanghar district:

- 18 types of grains and grain-based products,
- 8 types of roots and tubers,
- 13 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 6 varieties of fish and seafoods,
- 2 varieties of eggs,
- 5 types of milk and milk products,
- 15 types of vegetables,
- 14 types of fruits,
- 11 types of fats/oils,
- 11 types of sugars and confectionary,
- 19 varieties of herbs, spices and condiments including salt,
- 6 types of beverages, and
- 2 composite dishes.

### 8.3.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat (mill-ground flour) is the staple food in the assessment area and is eaten five or more times a week. The women in the FGDs said they don't use wheat from a packet. Some indicated that they produce wheat in their own farms while others purchase from the market. Wheat (whole, brown) was reported to be expensive. Millet is sometimes consumed and fish was reported to be expensive. A large quantity of buffalo milk is also consumed and most said they keep these animals. Some of the population is Hindu and therefore do not consume beef.

The participants generally said no special foods are prepared for pregnant and breastfeeding mothers or for children aged 6–23 months. This is because these are poor households, and these groups eat whatever is available at home, just like other family members. Foods which are believed to have a “warm effect” such as eggs and spinach are avoided during pregnancy for fear of miscarriage. Pulses such as lentils are not given to lactating mothers and are believed to cause abdominal pain in both mother and child.

Children aged 6–23 months are given soft foods which the child can easily swallow such as bread with milk and soft rice. Some FGD participants reported that vegetables such as cauliflower, and pulses such as chickpeas, are not given to children as they are believed to cause abdominal pain.

People suffering from illness are given soft foods such as boiled rice, bread, rusks and khichri.

All FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables, and fruit vendors were reported to come occasionally to some villages. Participants also reported that self-production of buffalo milk and wheat contributes significantly to household diets. Economic constraints and inflation were repeatedly indicated to be the cause of poor household diets and the reason households could not access certain foods such as fish and wheat flour (brown, whole).

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 8.3.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 8.3.1).

Table 8.3.1: Sanghar livestock/poultry zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	186.52
Macronutrients diet (MAC)	Yes	4	3	190.19
Nutritious diet (NUT)	Yes	14	9	311.38
Food habits nutritious diet (FHAB)	Yes	23	10	558.95

\* Averaged across seasons.

### 8.3.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 184.83 PKR and 187.74 PKR per day, and features only two of the 134 foods found in the markets excluding breastmilk. The annual cost of the diet for a typical family is estimated to be 68,100 PKR (Annex 3.1-13).

It should be noted that the cost of the diet of a child aged 12–23 months only includes solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key foods in the EO diet are millet (pearl, local) and wheat (local/hyv).



Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely on it for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. RNIs for fat, vitamins including vitamin A, folic acid, vitamin B12 and vitamin C, and minerals including calcium, are not met by this diet (Annex 3.2-13).

### 8.3.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 309.44–313.92 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-13).

The NUT diet includes 13 of the 134 foods known to be eaten by people in the livestock/poultry livelihood zone of Sanghar district, however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat (local or hyv) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6 and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Ghee (cow) was selected as an inexpensive and rich source of fat; trout fish (fish, Indian river shad, raw) was selected as an inexpensive and rich source of vitamin B12 and calcium, and millet (pearl, local) was selected as inexpensive and rich source of iron (Table 8.3.2).

Table 8.3.2: Sanghar livestock/poultry zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	51	2.6	2 894	2.5	3.2	3.0	0.8	0.0	0.0	5.7	2.7	3.2	4.7	1.6	0.0	1.0	2.5	3.6
Baking powder	8	0.4	1 526	1.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35.1	0.0	0.0
Breastmilk	194	10.0	0	0.0	2.3	1.1	5.6	5.4	7.0	0.9	2.1	0.8	0.4	1.8	3.4	2.1	0.0	0.5
Fish, trout (Fish, Indian river shad, raw)	81	4.1	17 775	15.6	1.6	6.4	2.9	0.3	0.0	0.0	0.0	1.8	0.0	0.0	50.1	32.4	19.1	3.7
Ghee, cow)	73	3.8	9 999	8.8	12.2	0.0	53.9	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0
Milk, cow, whole fat, pasteurized, UHT	5	0.3	474	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.0	0.1	0.0	0.9	0.2	0.0	0.1
Millet, pearl, local	458	23.5	21 295	18.7	30.8	27.5	16.9	2.6	0.0	26.9	33.1	24.9	30.0	15.7	0.0	7.3	35.9	33.0
Egg, chicken, farmed, raw	93	4.8	15 873	14.0	2.4	7.0	6.2	8.6	0.0	3.9	11.7	3.1	3.1	5.0	43.6	0.0	7.0	5.1
Spinach, raw	239	12.3	8 818	7.8	1.2	3.7	0.9	54.6	45.4	1.6	6.7	3.3	10.5	49.6	0.0	8.1	5.3	5.0
Guava, green	23	1.2	1 021	0.9	0.3	0.1	0.1	0.4	46.2	1.1	0.6	0.3	0.6	1.2	0.0	0.1	0.1	0.2
Cheese, cottage	11	0.6	1 459	1.3	0.7	1.4	2.1	1.3	0.0	0.1	1.6	0.7	0.0	0.5	1.9	3.4	0.1	0.9
Bay leaf, dried	3	0.2	323	0.3	0.2	0.1	0.2	0.5	1.3	0.0	0.4	0.1	1.2	0.6	0.0	1.0	1.3	0.3
Wheat, flour, brown, whole (Wheat, whole, raw)	76	3.9	4 137	3.6	4.9	4.5	1.6	0.0	0.0	8.4	2.8	4.1	5.2	3.1	0.0	1.2	3.7	5.0
Wheat, local or hyv	632	32.4	28 060	24.7	39.9	44.9	8.8	0.0	0.0	51.4	37.7	57.6	44.2	21.0	0.0	8.1	24.2	42.6
Total	1 948	100	113 653	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	225	100	118	100	162	113	286	138	100	100	102	143	264

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Sanghar's livestock/poultry livelihood zone are indicated in Annex 3.4-13. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, pantothenic acid, folic acid, vitamin B12 and calcium are met only to 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 8.3.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the livestock/poultry livelihood zone of Sanghar, but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven needs to be able to purchase the FHAB diet from the market is 523.95–575.98 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-13).

Table 8.3.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Sanghar district's livestock/poultry zone.

Twenty-two of the 134 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat flour (brown, wholegrain) and wheat (local or hyv) are important sources of protein, energy, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc providing most of these nutrients. Spinach is an important source of vitamin A, vitamin C and folic acid, and dairy products i.e. buffalo milk is an important source of fat, vitamin B12 and calcium.

Table 8.3.3: Sanghar livestock/poultry zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	199	5.9	11 162	5.5	12.3	11.4	3.1	0.0	0.0	18.0	8.0	12.8	13.1	3.7	0.0	4.0	13.4	14.8
Breastmilk	194	5.8	0	0.0	2.3	1.0	5.6	3.2	3.8	0.8	1.6	0.9	0.3	1.1	3.4	2.1	0.0	0.6
Milk, goat	23	0.7	2 361	1.2	0.3	0.4	0.7	0.2	0.1	0.2	0.5	0.2	0.2	0.2	3.7	1.3	0.1	0.2
Bengal gram, whole, dried, raw	24	0.7	3 687	1.8	1.6	2.5	1.1	0.0	0.0	1.4	1.5	1.2	2.1	2.9	0.0	1.9	3.0	1.6
Cookies (bakery)	2	0.1	556	0.3	0.2	0.1	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.5	0.0
Ghee, vegetable	20	0.6	2 796	1.4	3.4	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Ghee, cow	19	0.6	2 531	1.2	3.1	0.0	13.6	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
Milk, cow, whole fat, pasteurized, UHT	65	1.9	5 762	2.8	0.8	1.0	1.8	0.7	0.6	0.7	4.2	0.5	0.6	0.4	10.7	2.6	0.2	0.7
Jaggery, sugarcane, solid	18	0.5	1 022	0.5	1.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.6	0.4	0.0
Turneric, dried	2	0.1	845	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.7	0.1	0.0	0.1	1.1	0.2
Cumin, seeds	2	0.1	1 944	1.0	0.2	0.2	0.3	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.8	1.3	0.2
Fenugreek, leaf	86	2.6	8 485	4.2	0.6	1.6	0.1	7.4	13.8	1.4	3.9	1.2	7.5	5.7	0.0	7.0	3.7	0.8
Salt	3	0.1	109	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fennel, seeds	6	0.2	1 793	0.9	0.4	0.5	0.7	0.0	0.0	0.5	0.5	0.0	0.5	0.0	0.0	3.0	1.5	0.6
Milk, buffalo	742	22.1	61 508	30.1	13.7	15.5	36.6	15.0	3.6	6.8	29.9	8.2	6.0	2.8	61.9	42.7	0.0	9.1
Millet, pearl, flour, local	53	1.6	3 369	1.7	3.5	2.8	1.8	0.0	0.0	2.0	2.2	2.4	2.0	0.8	0.0	0.7	4.0	2.1
Egg, chicken, farmed, raw	43	1.3	8 138	4.0	1.1	3.2	2.8	2.4	0.0	1.5	4.1	1.5	1.0	1.4	20.1	0.0	4.5	2.5
Onion	424	12.6	16 391	8.0	3.5	3.0	0.6	0.0	10.3	3.1	2.0	2.3	9.0	4.1	0.0	3.6	1.2	2.1
Spinach, raw	466	13.9	17 349	8.5	2.3	7.0	1.7	63.4	48.1	2.6	10.0	6.8	14.8	57.9	0.0	16.1	14.4	10.3
Bay leaf, dried	6	0.2	661	0.3	0.4	0.3	0.4	0.7	1.5	0.0	0.6	0.3	1.8	0.7	0.0	2.1	3.8	0.6
Tomato, ripe	195	5.8	16 619	8.1	0.8	0.9	0.4	2.8	18.1	2.2	2.3	1.4	2.5	1.9	0.0	0.4	1.3	0.5
Wheat, flour, brown, whole (Wheat, whole, raw)	341	10.2	18 442	9.0	21.8	19.5	7.3	0.0	0.0	30.9	9.3	19.3	16.7	8.3	0.0	5.4	23.0	23.4
Wheat, local or hyv	416	12.4	18 485	9.1	26.3	29.0	5.8	0.0	0.0	27.7	18.8	39.9	21.0	8.3	0.0	5.5	22.3	29.7
Total	3 351	100	204 015	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	229	100	199	184	198	150	272	191	168	100	100	102	250

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy, fat, vitamin B12, calcium and iron is only met to 100 per cent for the CoD family in all seasons of the year. All other nutrients exceed 100 per cent of RNI and no nutrient is difficult to obtain from foods found locally (Annex 3.6-13).

### 8.3.8 Seasonal fluctuations in the food habits nutritious diet

The daily cost of the FHAB diet is highest in summer and lowest in winter. This is due to the high cost of vegetables and vegetable products during the former time of year.

### 8.3.9 The contribution of food groups to the cost of the food habits nutritious diet

Dairy, i.e. milk and milk products, followed by staple foods (grains and grain-based products) are the costliest elements of the FHAB diet for the CoD family in the livestock/poultry livelihood zone of Sanghar district (Annex 3.7-13). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost of the FHAB diet, yet they are the least expensive. Households rely on these foods to provide most of their calories and essential nutrients. The price of dairy products remains the same throughout the four seasons.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to meeting nutrient requirements: 38 per cent of the total energy needs of the child, 69 per cent of fat, 30 per cent of vitamin A, 29 per cent of vitamin B2, 57 per cent of vitamin B12, 30 per cent of vitamin C, and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) and spinach were selected by the software as important sources of iron.

### 8.3.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 8.3.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor, middle and better-off households while the NUT diet is not affordable only for very poor households.

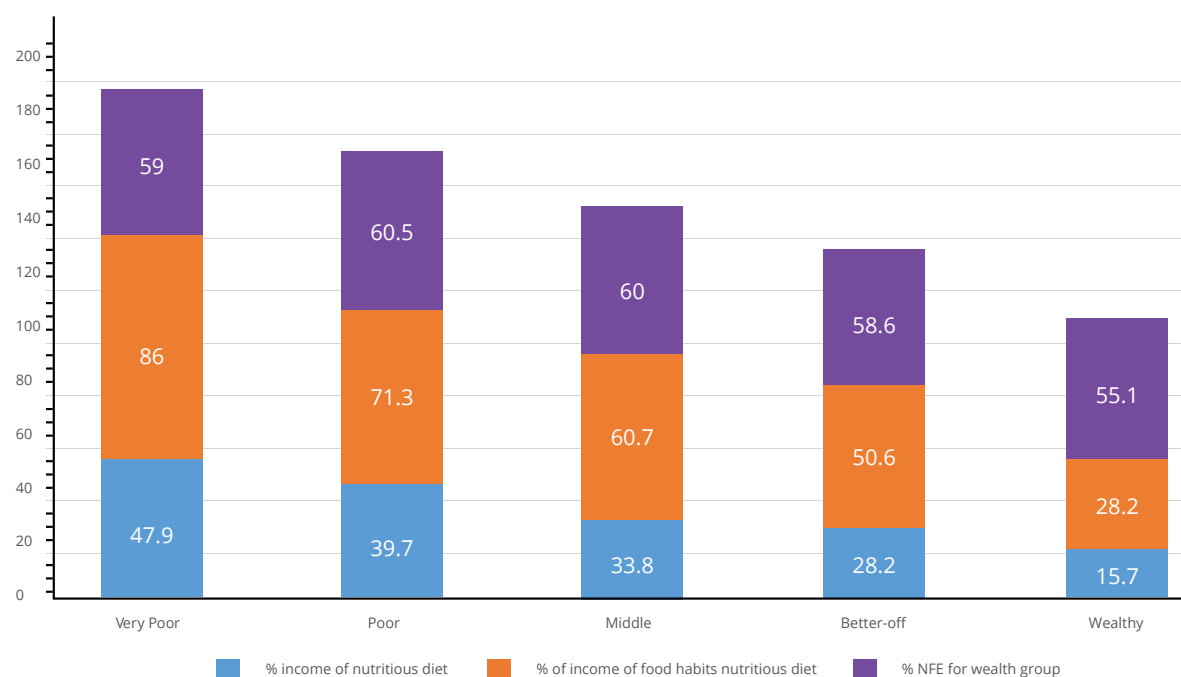
Table 8.3.4: Sanghar livestock/poultry zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	Annual cost of nutritious diet	% income of nutritious diet	Annual cost of food habits nutritious diet	% of income of food habits nutritious diet	Annual non- food expenditure	% NFE for wealth group
Very poor	236,904	113,653	47.9	204,015	86	139,830	59.0
Poor	285,912	113,653	39.7	204,015	71.3	172,927	60.5
Middle	336,240	113,653	33.8	204,015	60.7	201,890	60.0
Better-off	404,016	113,653	28.2	204,015	50.6	236,908	58.6
Wealthy	725,412	113,653	15.7	204,015	28.2	399,977	55.1

Figure 3.13.1 visually represents the affordability analysis for the five wealth groups in Sanghar's livestock/poultry livelihood zone based upon the numbers presented in Table 8.3.4 above. The results show that only wealthy households can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 45 per cent for very poor, 32

per cent for poor, 21 per cent for middle, and 9 per cent for better-off households. The additional amount of money required per year by these households to be able to afford a FHAB diet plus non-food expenditure is 106,941 PKR, 91,030 PKR, 69,665 PKR and 36,907 PKR respectively.

Figure 8.3.1: Sanghar livestock/poultry zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 8.3.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

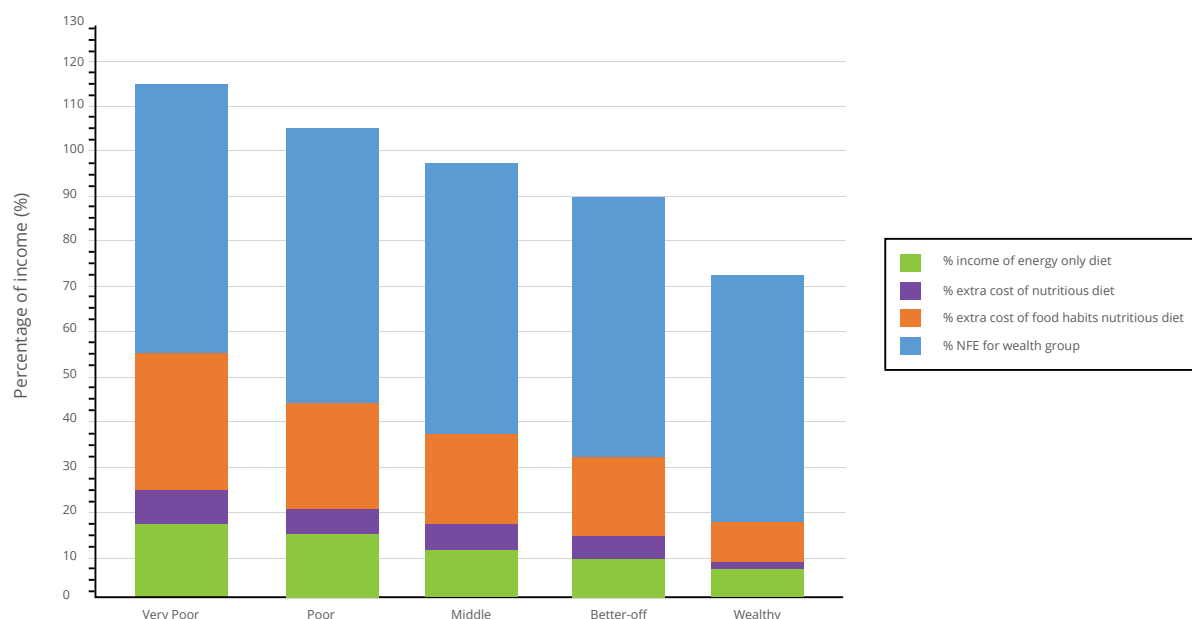
Availability of foods is not a challenge in Sanghar district's livestock/poultry zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap for a nutritious diet for very poor and poor households is 45 per cent and 32 per cent of income, respectively. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>14</sup> Activities could be identified through district-specific household economic approach studies.

<sup>14</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

### Model 2. The impact of buffalo rearing on the cost, quality, composition and affordability of a FHAB diet.

Buffalo milk is widely consumed in the district. FGD participants said most people in the area are rearing their own buffalos. The software identified buffalo milk to be an important source of fat, vitamin B12 and calcium, but it also contributes 30 per cent of the total cost of the FHAB diet. The model brings this cost to zero by simulating self-production through rearing of buffalos to supply households with milk. The model assumes buffalos are provided on a revolving fund basis with training given to households at the initial stage of the project. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 126,500 PKR which is still beyond the reach of the very poor and poor, however, it significantly narrows the affordability gap to 12 per cent and 5 per cent respectively. The model assumes that this gap could be filled with the additional income generated from the sale of part of the production (Figure 8.3.2).

Figure 8.3.2: Sanghar livestock/poultry zone: Affordability of EO, NUT and FHAB diets with buffalo rearing



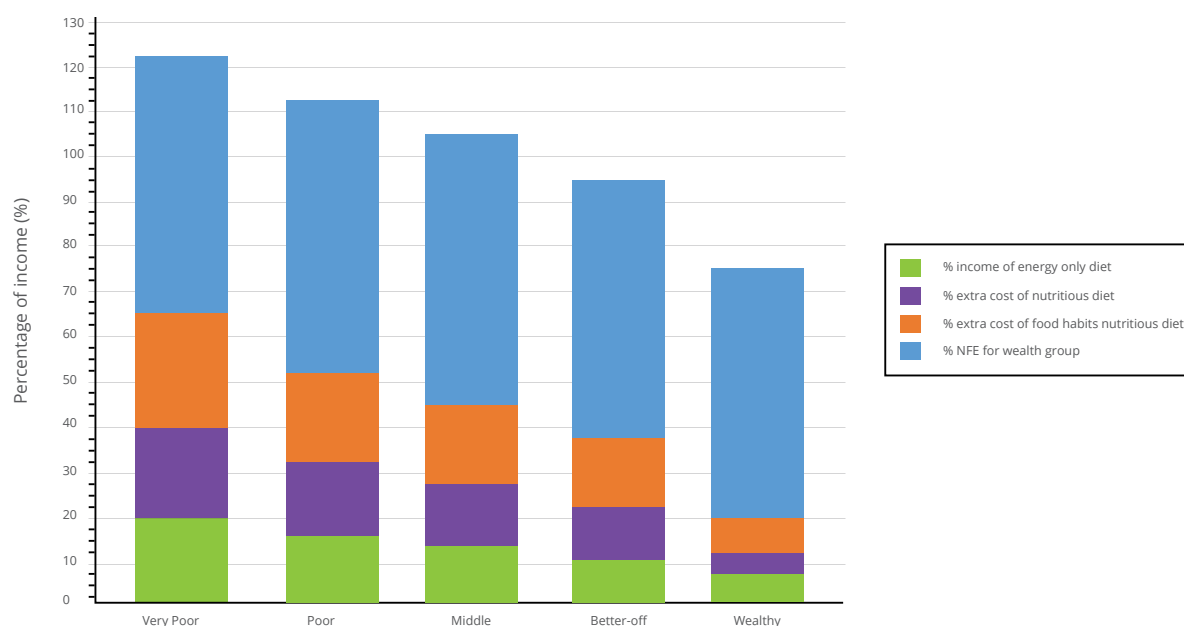
### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a nutritious diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 204,000 PKR which is not affordable for very poor, poor, middle and better-off households. When the family size is reduced to five, the cost is significantly reduced to 147,500 PKR. This is still not affordable for very poor, poor and middle households, however, the affordability gap is significantly narrowed to 21 per cent, 12 per cent and 4 per cent, respectively (Figure 8.3.3). A corresponding reduction of non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.



Figure 8.3.3: Sanghar livestock/poultry zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 8.3.12 Key findings

**The FHAB diet is approximately thrice as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet, which does not consider food habits, is 1.7 times as expensive as the EO diet, meaning that it costs 1.7 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is three times as expensive as the EO diet and 1.8 times as expensive as the NUT diet. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, trout fish and millet provide most of the essential micronutrients in Sanghar district's livestock/poultry livelihood zone.**

The NUT diet, which does not consider local food habits, is hypothetical but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software has included trout fish (fish Indian river shad, raw) as an inexpensive and rich source of vitamin B12 and calcium, and millet (pearl, local) as an inexpensive and rich source of iron. Both foods contribute the highest proportion of these nutrients in the diet. In addition, millet is an important source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, folic acid and zinc. FGD participants indicated millet is not frequently consumed and reported that fish is beyond their reach because of economic constraints.

**Pantothenic acid, folic acid, vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software met the specifications for pantothenic acid, folic acid, vitamin B12 and calcium but only reached 100 per cent of RNI in the NUT diet. Thus, while the software has found a solution, these nutrients are the hardest for it to meet using locally-available foods, even if local dietary preferences are not accommodated.

The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.

The RNIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. At least 100 per cent of RNI has been achieved for every mineral or vitamin using foods from the local markets. The foods selected by the software for the NUT diet are all available in almost all markets visited and are therefore considered to be available in the Sanghar district livestock/poultry livelihood zone. The FGD participants also confirmed that a variety of food is available in the market but they are limited by economic status. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The comparison of total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor, poor, middle and better-off households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and selects foods that are more expensive to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some pulses, such as lentils, are avoided by breastfeeding mothers because of the belief that they cause abdominal pain to mother and child. Vegetables such as spinach are taboo for pregnant women for fear of miscarriage.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **8.3.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of the increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for children aged 12–23 months.
- Food taboos have been reported, indicating that interventions based on food or nutrients alone will be insufficient to ensure a nutritious diet.

### **Recommendations**

#### **Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.**

The CoD analysis indicates that millet (pearl, local) is an inexpensive and rich source of iron and trout fish (fish, Indian river shad, raw) is an inexpensive and rich source of vitamin B12 and calcium. However, these are not frequently consumed and are therefore excluded from the FHAB diet. Promoting the frequent consumption of these foods through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care required by lactating mothers in terms of increasing the amount, frequency and variety of foods they receive.

### **Promoting buffalo rearing helps improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The community is used to drinking buffalo milk and some of the households are already rearing buffalos. The model could be further promoted to significantly lower the annual cost of the FHAB diet and to make it affordable even for the very poor. This will also increase income and thus further improve affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis indicates that at current levels of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The analysis revealed the affordability gap for the FHAB diet is 45 per cent and 32 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes for the very poor and poor would allow households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.









# Cost of the Diet Analysis in Gilgit-Baltistan (GB)

## 09.

## Cost of the Diet Analysis in Gilgit-Baltistan (GB)

### 9.1 Gilgit district, agriculture livelihood zone

#### 9.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Nomal, Sakwar, Juglot, Jugot, Minawar and Oshikhandas. The reference year selected for data collection was 16 March 2017 to 15 March 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 October 2017 to 15 March 2018
- Season 2 (Autumn): 1 September 2017 to 15 October 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 16 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item, can be found in Annex 1.14.

#### 9.1.2 Availability of foods in the local markets

The data collection team found 92 foods in the markets of the six villages of the agriculture livelihood zone in Gilgit district:

- 10 types of grains and grain-based products,
- 3 types of roots and tubers,
- 9 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 2 varieties of eggs,
- 2 types of milk and milk products,
- 12 types of vegetables,
- 15 types of fruits,
- 6 types of fats/oils,
- 9 types of sugars and confectionary,
- 17 varieties of herbs, spices and condiments including salt, and
- 3 types of beverages.

#### 9.1.3 Typical food consumption habits and food taboos

The interviews and FGDs show that wheat is the staple food in the assessment area and is eaten daily. Most of the women said they use packaged white wheat flour, referred to as “simple flour”, which they purchase to prepare

bread. Some said they eat maize flour during the months of December and January. They said both wheat and maize are produced locally.

Vegetables such as carrot, cabbage and spinach are grown in kitchen gardens in summer and participants said they prefer to consume what they have produced themselves. They also said that households rear chickens for eggs, and keep cows and buffalos for milk and milk products.

All the women in the FGDs said, generally, special foods are not prepared for pregnant women and lactating mothers. Some said pregnant women are given foods such as milk and eggs. Pickles and green tea were said to be not good for the mother and the foetus. Egg yolk is believed to cause constipation and hence is not given for pregnant women. The women also noted that lactating mothers are given soft foods such as soup, sharbat (wheat and butter) and milk. Eggs and meat are also good for the health of both mother and baby and facilitate breastmilk production but fresh butter is not considered to be healthy for either. Some foods such as beans are believed to cause abdominal ache and are not given to lactating mothers.

Children aged 6–23 months are mostly fed on soft foods such as porridge, egg, milk, Cerelac (infant cereal), and local dishes such as dowsow (flour and milk) and fruits such as banana. The women said they don't give children hard foods such as meat, beans and vegetables that they do not consider easily digestible.

People suffering from illness are given soft foods such as soup, dowsow and curry without chilli, and avoid oily foods which are believed to aggravate ill health.

All the FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables, and some are costly. Participants are from farming households and said they get vegetables, fruits and some grains such as wheat from their own farm.

The food taboos described above indicate that cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

### 9.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 9.1.1).

Table 9.1.1: Gilgit agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	87.29
Macronutrients diet (MAC)	Yes	4	3	102.97
Nutritious diet (NUT)	Yes	13	7	312.03
Food habits nutritious diet (FHAB)	Yes	20	9	441.62

\* Averaged across seasons.



### 9.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to be 87.29 PKR per day irrespective of the season. It features only two of the 92 foods found in the markets of the six villages excluding breastmilk. The annual cost of this diet for a typical family is estimated to be 31,900 PKR (Annex 3.1-14).

It should be noted that the cost of the diet of a child aged 12–23 months only includes the solid and semi-solid complementary foods the child is given; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key foods in the EO diet are wheat (flour, brown wholegrain, raw) and wheat (flour, white).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely on it for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Gilgit district agriculture livelihood zone across all seasons, RDIs for fat, vitamins including vitamin A, vitamin B2, folic acid, vitamin B12 and vitamin C, and minerals including calcium and iron, are not met by this diet (Annex 3.2-14).

### 9.1.6 Nutritious diet

A NUT diet that meets both average energy requirements and RNIs for micronutrients is estimated to cost 290.11–329.12 PKR per day, depending on the season. Lactating mothers are the most expensive family members (Annex 3.3-14).

The NUT diet includes 12 of the 92 foods known to be eaten by people in the agriculture zone of Gilgit district; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat flour (brown, wholegrain, raw) was selected by the software as an inexpensive and rich source of protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive and rich source of vitamin A and folic acid and provides most of these nutrients in the diet. Additionally, wheat flour (white) was selected as an inexpensive and rich source of energy; ghee (cow) as an inexpensive and rich source of fat; egg (chicken, farm) as an inexpensive and rich source of vitamin B12; fenugreek (leaf) as an inexpensive and rich source of vitamin C; and baking powder as an important and inexpensive source of calcium (Table 9.1.2).

Table 9.1.2: Gilgit agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	580	26.7	17 395	15.3	36.0	36.8	8.9	0.1	0.0	65.1	33.3	48.3	43.3	15.2	0.0	11.4	33.3	50.2
Wheat, flour, white	587	27.0	9 095	8.0	37.9	34.9	7.1	0.0	0.0	17.3	10.7	31.3	10.7	10.6	0.0	2.8	26.1	26.0
Baking powder	12	0.5	7 244	6.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.2	0.0	0.0
Breastmilk	194	8.9	0	0.0	2.3	1.1	5.6	3.7	4.6	0.9	2.3	1.1	0.3	1.5	3.4	2.0	0.0	0.7
Egg, chicken, domestic, cooked	45	2.1	10 005	8.8	1.5	3.8	4.4	4.0	0.0	1.7	5.4	2.5	1.1	1.8	21.1	1.1	5.0	2.8
Ghee, cow	84	3.9	11 191	9.8	14.0	0.0	61.7	20.8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.0	0.0
Turneric, dried	4	0.2	1 497	1.3	0.3	0.2	0.3	0.0	0.0	0.1	0.3	0.3	1.4	0.2	0.0	0.3	1.7	0.5
Fenugreek, leaf	308	14.1	15 636	13.7	2.1	6.4	0.5	30.8	60.5	6.3	19.7	5.4	30.5	29.0	0.0	24.4	11.2	3.5
Egg, chicken, farmed, raw	161	7.4	32 509	28.5	4.2	13.1	10.6	10.2	0.0	6.8	21.7	7.3	4.4	7.3	75.4	0.0	14.5	10.8
Spinach, raw	189	8.7	6 439	5.7	0.9	3.1	0.7	29.8	23.9	1.3	5.7	3.6	6.8	33.2	0.0	6.4	5.0	4.8
Guava, green	7	0.3	711	0.6	0.1	0.0	0.0	0.1	9.6	0.3	0.2	0.1	0.1	0.3	0.0	0.0	0.1	0.1
Spearmint leaf, raw	2	0.1	229	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.4	0.1
Bay leaf, dried	4	0.2	1 941	1.7	0.3	0.2	0.2	0.5	1.1	0.0	0.6	0.2	1.2	0.6	0.0	1.2	2.0	0.4
Total	2 176	100	113 892	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	207	100	171	151	159	105	210	170	119	100	103	120	214

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of RNI met for essential macro- and micronutrients by the NUT diet for the typical family in the Gilgit agriculture livelihood zone are indicated in Annex 3.4-14. It is indicated that foods available in local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12 and calcium requirements are met only to 100 per cent, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 9.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the agriculture livelihood zone of Gilgit but reflects the least expensive way for the typical family to meet specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 398.65–471.23 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-14).

Table 9.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Gilgit district's agriculture livelihood zone.

Nineteen of the 92 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software for this diet, Wheat flour (white) is an important source of protein, energy, niacin and iron, and provides most of these nutrients. Wheat flour (brown, wholegrain, raw) is an important source of vitamin B1 and zinc and provides most of these nutrients. Additionally, fenugreek (leaf) is an important source of vitamin A, vitamin B6, vitamin C and folic acid; ghee (cow) of fat; baking powder of calcium; and egg (chicken, farm) of vitamin B2 and vitamin B12.

Table 9.1.3: Gilgit agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (Kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	326	12.8	9 774	6.1	20.3	20.4	5.0	0.1	0.0	44.4	18.9	29.0	25.0	8.2	0.0	6.5	19.4	31.4
Wheat, flour, white	633	24.8	9 810	6.1	40.9	37.3	7.7	0.0	0.0	22.7	11.7	36.0	11.8	10.9	0.0	3.1	29.2	31.2
Baking powder	11	0.4	6 623	4.1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.7	0.0	0.0
Breastmilk	194	7.6	0	0.0	2.3	1.1	5.6	3.9	4.4	1.1	2.3	1.2	0.3	1.4	3.1	2.1	0.0	0.7
Tea, powder	6	0.3	4 687	2.9	0.4	0.7	0.0	0.0	0.0	0.0	2.2	1.0	0.4	0.6	0.0	0.3	0.2	0.4
Bengal gram, whole, dried, raw	21	0.8	3 139	1.9	1.4	2.4	0.9	0.0	0.0	1.8	1.9	1.5	2.1	3.4	0.0	1.6	2.3	1.8
Cookies (bakery)	11	0.4	2 877	1.8	0.9	0.3	1.6	0.1	0.0	0.1	0.2	0.3	0.1	0.1	0.2	0.1	1.8	0.1
Egg, chicken, domestic, cooked	65	2.6	14 584	9.0	2.2	5.5	6.3	6.1	0.0	3.1	8.0	3.8	1.7	2.6	27.9	1.7	7.5	4.6
Ghee, cow	59	2.3	7 880	4.9	9.9	0.0	43.5	15.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0
Turneric, dried	3	0.1	998	0.6	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.2	1.0	0.1	0.0	0.2	1.2	0.4
Cumin, seeds	2	0.1	1 600	1.0	0.1	0.2	0.2	0.0	0.1	0.3	0.2	0.1	0.1	0.0	0.0	0.7	0.9	0.2
Fenugreek, leaf	333	13.0	18 716	11.6	2.3	6.8	0.5	35.1	62.1	8.3	21.6	6.2	33.8	29.9	0.0	26.9	12.5	4.2
Salt	3	0.1	103	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Egg, chicken, farmed, raw	161	6.3	32 508	20.2	4.2	12.9	10.6	10.8	0.0	8.2	21.9	7.8	4.5	6.9	68.7	0.0	15.0	12.1
Onion	424	16.6	30 690	19.0	3.5	3.3	0.6	0.0	12.0	4.7	2.9	3.2	10.4	5.5	0.0	3.6	1.0	2.7
Spinach, raw	171	6.7	6 471	4.0	0.8	2.8	0.6	28.4	20.4	1.4	5.2	3.4	6.3	28.6	0.0	5.9	4.6	4.9
Spearmint leaf, raw	1	0.1	153	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.3	0.1
Garlic, raw	6	0.3	2 057	1.3	0.2	0.2	0.0	0.0	0.9	0.2	0.3	0.2	1.5	0.0	0.0	0.1	0.1	0.2
Oil, mustard	21	0.8	3 376	2.1	3.6	0.0	15.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wheat, flour, white, refined	103	4.0	5 143	3.2	6.6	5.6	0.7	0.0	0.0	3.4	2.5	5.9	0.9	1.8	0.0	0.5	3.4	5.1
Total	2 554	100	161 190	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	210	100	162	159	131	104	197	165	125	110	101	116	193

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, energy, fat and calcium requirements are met only to 100 per cent of RNI for the CoD family in all seasons of the year. The RNI of all other nutrients is comfortably exceeded and there is no nutrient that is difficult to obtain from foods found in the local markets of the six villages of Gilgit district (Annex 3.6-14).

### 9.1.8 Seasonal fluctuations in the food habits nutritious diet

Prices are lowest in summer and slightly increase during autumn and winter.

### 9.1.9 The contribution of food groups to the cost of the food habits diet

Vegetables and vegetable products are the costliest elements of the FHAB diet for the CoD family in the agriculture livelihood zone of Gilgit district (Annex 3.7-14). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost, yet are the least expensive. In addition, they are seasonal and the cost differs between summer and winter.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to nutrient requirements: 38 per cent of total energy needs, 21 per cent of protein, 69 per cent of fat, 38 per cent of vitamin A, 32 per cent of vitamin B2, 51 per cent of vitamin B12, 37 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (brown, wholegrain, raw) and wheat flour (white) were selected by the software as important sources of iron.

### 9.1.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a nutritious diet. The gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 9.1.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households while the nutritious diet is not affordable for very poor households.

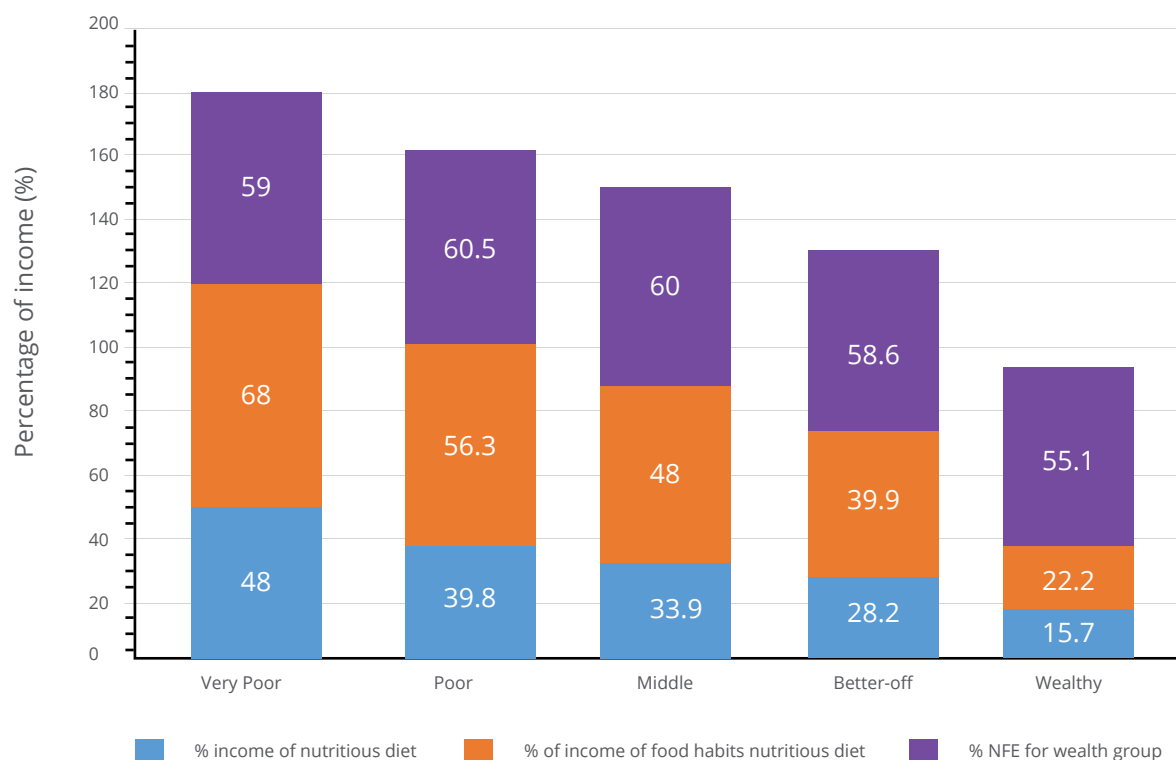
Table 9.1.4: Gilgit agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	113,892	48	161 190	68	139,830	59.0
Poor	285,912	113,892	39.8	161 190	56.3	172,927	60.5
Middle	336,240	113,892	33.9	161 190	48	201,890	60.0
Better-off	404,016	113,892	28.2	161 190	39.9	236,908	58.6
Wealthy	725,412	113,892	15.7	161 190	22.2	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 9.1.1 visually represents the affordability analysis for the five wealth groups in Gilgit's agriculture livelihood zone based upon the numbers presented in Table 9.1.4 above. The results show that the better-off and wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 27 per cent for very poor, 17 per cent for poor, and 8 per cent for middle wealth groups respectively. The additional amount of money they require per year to afford a FHAB diet plus non-food expenditure is 64,116 PKR, 48,205 PKR and 26,840 PKR respectively.

Figure 9.1.1: Gilgit agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 9.1.11 Modelling nutritional interventions

Three interventions were modelled to examine the effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Gilgit district and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a FHAB diet for very poor and poor households is 27 per cent and 17 per cent respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>15</sup> Activities could be identified through district-specific household economic approach studies.

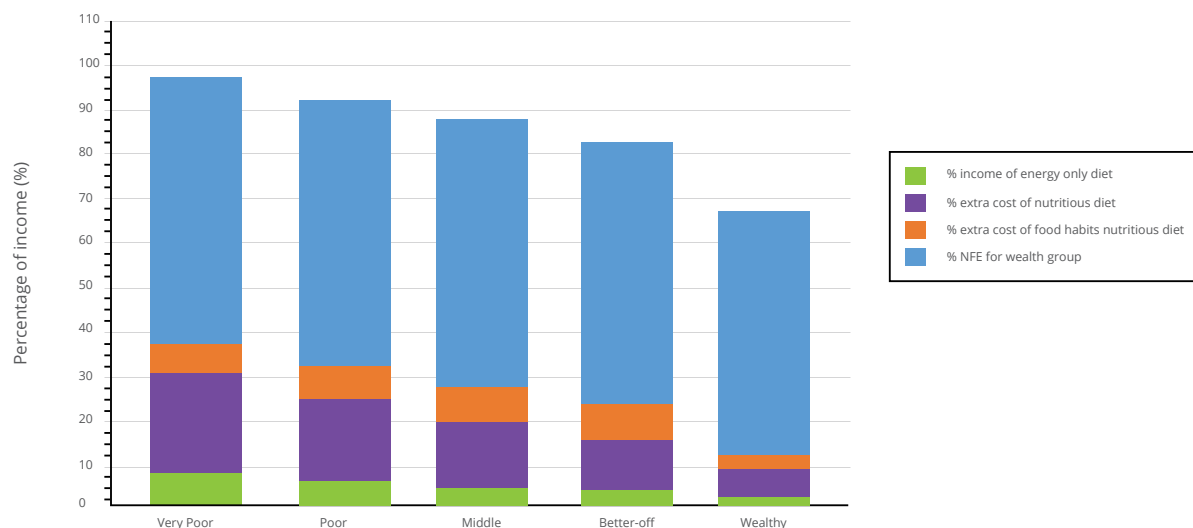
<sup>15</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.



### Model 2. The impact of self-production of vegetables in kitchen gardens on the cost, quality, composition and affordability of a FHAB diet.

Vegetables and vegetable products are the most expensive food groups in the FHAB diet. Onions, fenugreek (leaf) and spinach are the three vegetables included by the software and together contribute 34.6 per cent of the total annual cost of the diet. Fenugreek (leaf) is an important source of vitamin A, vitamin B2, vitamin B6, vitamin C, folic acid and calcium; spinach is an important source of vitamin A, vitamin C and folic while onion is added to almost all dishes to improve flavour. The model brings down the cost of these key vegetables to zero by simulating self-production at household level and promoting the growth of these vegetables in kitchen gardens. The current model assumes provision of inputs such as vegetable seeds and training to households at the start of the programme. Since households in this livelihood zone already maintain kitchen gardens, this model assumes that they can be supported to grow the vegetables identified as having high nutritional value in the FHAB diet. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the FHAB diet to 92,281.94 PKR which is affordable even for very poor households, with an additional saving of about 2 per cent of their income (Figure 9.1.2).

Figure 9.1.2: Gilgit agriculture zone: Affordability of EO, NUT and FHAB with vegetable cultivation in kitchen gardens

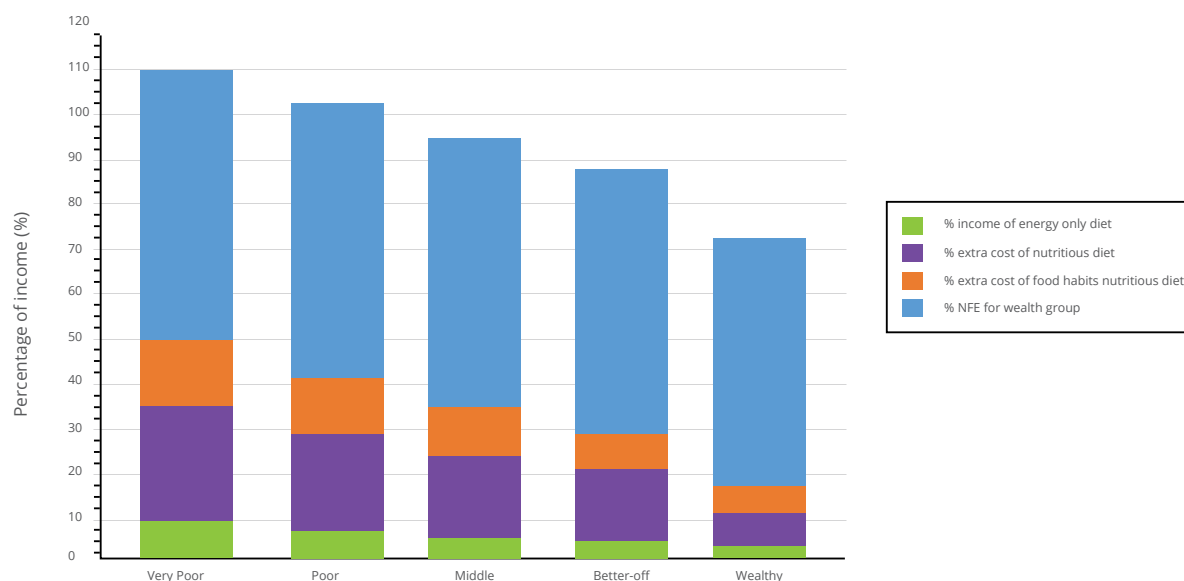


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 161,200 PKR, which is not affordable for very poor, poor and middle households. When the family size is reduced to five, however, the cost is significantly reduced to 118,500 PKR. This is affordable for poor and middle households, and leaves an affordability gap of only 9 per cent for very poor households (Figure 9.1.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 9.1.3: Gilgit agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 9.1.12 Key findings

**The FHAB diet is approximately five times as expensive than a diet that only meets energy requirements.**

The results from the cost of the three diets indicate that the NUT diet is 3.6 times as expensive as the EO diet, meaning that it costs 3.6 times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is five times as expensive as the EO diet and 1.4 times as expensive as the NUT diet that does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a nutritious diet, wheat (brown, wholegrain, raw) provides most of the essential micronutrients in the agriculture livelihood zone of Gilgit district.**

The NUT diet, which does not consider local food habits, is hypothetical. However, it gives an indication of which foods found on the local market are the least expensive and most nutritious. The software has included wheat (brown, wholegrain, raw) as a locally-available, inexpensive source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, contributing most of these nutrients. FGD participants confirmed that wheat is produced locally.

**Vitamin B12 and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software reached 100 per cent of the RNI for vitamin B12 and calcium in the NUT diet. Thus, while the software found a solution, these nutrients which only just reached 100 per cent are the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

**The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has identified that the RNIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the NUT diet are all available in almost

all markets visited and are therefore considered to be available in the agriculture livelihood zone of Gilgit district. The FGD participants also confirmed that a variety of foods is available in the markets, and that they themselves cultivate a variety of vegetables, fruits and grains such as wheat and maize, and keep animals. Some vegetables were described as seasonal and therefore can be expensive. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor, poor and middle households cannot afford the FHAB diet. This is because the software considers typical dietary habits, such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also on local traditions and culture. Some food types such as egg yolk, which is thought to cause constipation, are believed to be not good for pregnant women. Beans are believed to cause abdominal ache in lactating mothers.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of the child aged 12–23 months.

## **9.1.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 month.
- Some nutritionally-rich foods, such as eggs, are taboos for pregnant women and their consumption is restricted.

### **Recommendations**

#### **Promoting vegetable production in kitchen gardens can help improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in able accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The model promoting self-production of key vegetables such as fenugreek, spinach and onion can lower the annual cost of the FHAB diet, making it affordable even by the very poor. It also increases income, further improving affordability.

#### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and

minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis shows that very poor households are left with an income gap of only 9 per cent to afford a FHAB diet if the family size is limited to five, a gap that may be filled with the corresponding reduction in non-food expenditure. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 27 per cent and 17 per cent for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes for the very poor and poor would allow them to purchase a variety of foods from the local market and enable them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## 9.2 Gilgit district, livestock/poultry livelihood zone

### 9.2.1 Market survey to collect price data

Surveys were conducted in the following six villages: Danyore, Gilgit, Baseen, Gure, Jalalabad and Rahimabad. The reference year selected for data collection was 16 March 2017 to 15 March 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 16 October 2017 to 15 March 2018
- Season 2 (Autumn): 1 September 2017 to 15 October 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 16 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.15.

### 9.2.1 Availability of foods in the local markets

The data collection team found 115 foods in the markets of the six villages of the livestock/poultry livelihood zone in Gilgit district:

- 12 types of grains and grain-based products,
- 5 types of roots and tubers,
- 13 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 4 varieties of fish and seafoods,
- 2 varieties of eggs,
- 3 types of milk and milk products,
- 15 types of vegetables,
- 16 types of fruits,
- 10 types of fats/oils,
- 9 types of sugars and confectionary,
- 18 varieties of herbs, spices and condiments including salt, and
- 4 types of beverages.

### 9.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and eaten daily. The women said they produced their own wheat but depend on the flour they purchase from market.

Fresh vegetables were said to be produced and available in summer, and dried vegetables in winter. The participants also said they rear chickens for eggs, and cows and buffalos for milk and milk products.

Most women in the FGDs said pregnant women are never given special foods while some mentioned milk, fruits, dates and eggs. Yogurt is also given and is believed to be healthy for the foetus. Beef is believed to be unhealthy for the proper development of the brain in utero, and is therefore not given to pregnant women. Chicken, on the other hand, is said to be good.

The women also noted that lactating mothers were given soft foods such as soup, milk, traditional foods including sharbat (wheat and butter) and moul, which are believed to facilitate breastmilk production. Beef is given in the form of soup and yogurt is said to keep the baby healthy. This special treatment continues for about two months and then women revert to regular family meals. Food with chillies is generally believed to be not good for lactating mothers.

Children aged 6–23 months are mostly fed on milk and sweet foods, and local dishes such as dowsow (flour and milk) and fruits such as banana. Meat is given only in the form of soup.

People suffering from illness are given soft foods such as majji, soup and dowsow. Hard foods such as beef are not given to those who are unwell as it is believed they cannot digest it.

All the FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables, and some are costly. The participants were from farming households and said they get fresh vegetables in summer. Some fruits and grains such as wheat are also grown in their farms.

The food taboos described above indicate cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of the local dietary habits.

### 9.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 9.2.1).

Table 9.2.1: Gilgit livestock/poultry zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	3	2	71.1
Macronutrients diet (MAC)	Yes	4	3	94.77
Nutritious diet (NUT)	Yes	17	8	284.98
Food habits nutritious diet (FHAB)	Yes	21	11	460.7

\* Averaged across seasons.

### 9.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to be 71.10 PKR per day irrespective of season. It features only two of the 115 foods found in the markets of the six villages excluding breastmilk. The annual cost of this diet for a typical family is estimated to be 26,000 PKR (Annex 3.1-15).

It should be noted that the cost of the diet of a child aged 12–23 months only includes solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day. The key foods in the EO diet that are wheat (flour, white) and maize (yellow, dried raw).



Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote this diet, as people who rely on it for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Gilgit district livestock/poultry livelihood zone across all seasons, RNIs for fat, vitamins including vitamin A, vitamin B2, folic acid, vitamin B12 and vitamin C, and minerals including calcium and iron, are not met by this diet (Annex 3.2-15).

### 9.2.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost 269.43–293.99 PKR per day, depending on the season. Lactating mothers are the most expensive family members (Annex 3.3-15).

The NUT diet includes 16 of the 115 foods known to be eaten by people in the livestock/poultry zone of Gilgit district; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Wheat flour (brown, wholegrain, raw) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, niacin, iron and zinc, and provides the highest proportion of these nutrients in this diet. Spinach was selected as an inexpensive and rich source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet. Maize (yellow, dried, raw) was selected as an inexpensive and rich source of vitamin B6; ghee (cow) as an inexpensive and rich source of fat; cow milk (whole fat, pasteurized) as an inexpensive and rich source of vitamin B2 and vitamin B12; and baking powder as an important and inexpensive source of calcium (Table 9.2.2).

Table 9.2.2: Gilgit livestock/poultry zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	energy	% energy	protein	% protein	fat	% fat	vit A	% vit A	vit C	% vit C	vit B1	% vit B1	vit B2	% vit B2	niacin	% niacin	vit B6	% vit B6	folic acid	% folic acid	vit B12	% vit B12	calcium	% calcium	iron	% iron	zinc	% zinc		
Wheat, flour, white	301	13.5	4 672	4.5	19.5	19.7	3.6	0.0	0.0	0.0	8.5	5.2	19.8	5.9	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	16.0	12.3	0.0	0.0	0.0	0.0		
Baking powder	13	0.6	6 748	6.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.7	0.0	0.0	0.0	0.0	0.0		
Maize, yellow, dried, raw	315	14.1	6 305	6.1	20.2	19.3	7.9	1.8	0.0	0.0	26.9	11.1	10.5	39.1	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	12.6	27.2	0.0	0.0	0.0	0.0		
Breastmilk	194	8.7	0	0.0	2.3	1.3	5.6	5.1	7.0	0.0	0.9	2.2	1.4	0.4	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	2.1	0.0	0.0	0.6	0.6	0.0	0.0		
Egg, chicken, domestic, cooked	13	0.6	2 451	2.4	0.4	1.2	1.3	1.6	0.0	0.0	0.5	1.5	0.9	0.4	0.6	0.2	0.3	1.8	0.8	0.8	0.8	0.8	0.8	0.8	6.2	0.3	1.8	0.8	0.8	0.8	0.8	0.8		
Ghee, cow	68	3.1	9 300	8.9	11.4	0.0	50.3	23.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0		
Milk, cow, whole fat, pasteurized, UHT	405	18.2	25 049	24.1	4.8	7.7	11.2	6.7	7.3	0.0	5.5	35.8	5.1	4.3	3.7	66.9	16.1	1.2	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Turmeric, dried	2	0.1	546	0.5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.6	0.1	0.6	0.1	0.0	0.0	0.1	0.8	0.2	0.2	0.2	0.2	0.2	0.2	
Cumin, seeds	2	0.1	823	0.8	0.1	0.2	0.2	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.1	0.2	0.2	0.2	0.2	0.2	0.2	
Fenugreek, leaf	15	0.7	869	0.8	0.1	0.3	0.0	2.0	4.3	0.0	0.3	0.9	0.3	1.6	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.6	0.2	0.2	0.2	0.2	0.2	0.2	
Millet, pearl, local	182	8.2	10 566	10.2	12.3	13.0	6.7	1.0	0.0	0.0	10.4	13.4	16.7	10.5	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	20.4	14.9	0.0	0.0	0.0	0.0	0.0	
Egg, chicken, farmed, raw	50	2.2	8 310	8.0	1.3	4.4	3.3	4.3	0.0	0.0	2.0	6.4	2.8	1.5	2.7	23.3	0.0	5.4	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Spinach, raw	249	11.2	12 564	12.1	1.2	4.6	0.9	53.3	47.4	1.6	7.2	5.8	9.7	51.7	0.0	8.6	7.8	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	7.8	5.9	0.0	0.0	0.0	0.0	0.0	
Guava, green	15	0.7	1 283	1.2	0.2	0.1	0.1	0.3	30.9	0.7	0.4	0.3	0.3	0.8	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Spearmint leaf, raw	3	0.1	364	0.4	0.0	0.1	0.0	0.1	0.6	0.1	0.1	0.6	0.1	0.1	0.4	0.0	0.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.2	0.2	0.2	0.2	0.2	0.2	
Bay leaf, dried	6	0.2	2 311	2.2	0.4	0.3	0.3	0.9	2.3	0.0	0.7	0.4	1.9	1.1	0.0	1.8	3.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	3.3	0.5	0.5	0.5	0.5	0.5	0.5	
Wheat, flour, brown, whole (Wheat, whole, raw)	395	17.7	11 858	11.4	25.3	27.4	8.4	0.1	0.0	0.0	42.4	14.6	35.8	23.6	16.1	0.0	6.3	27.1	29.1	0.0	0.0	0.0	0.0	0.0	0.0	6.3	27.1	29.1	0.0	0.0	0.0	0.0	0.0	
Total	2 229	100	104 019	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
% target met					100	189	100	100	126	100	167	111	170	156	100	100	100	100	233															

The percentage of target met is an average of the % nutrient requirements met over the year.

The percentages of RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Gilgit's livestock/poultry livelihood zone are indicated in Annex 3.4-15. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12, folic acid, vitamin C, calcium and iron requirements are met only to 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 9.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in the livestock/poultry livelihood zone of Gilgit, but reflects the least expensive way for the typical family to meet the specified amounts of energy and micronutrients using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 398.34–497.28 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-15).

Table 9.2.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Gilgit district's livestock/poultry zone.

Twenty of the 115 foods known to be eaten by people in the district are included in the FHAB diet. Among the foods selected by the software for this diet, wheat flour (white) is an important source of protein, energy, niacin, iron and zinc, providing most of these nutrients. Wheat flour (brown, wholegrain, raw) is an important source of vitamin B1, providing most of this nutrient. Spinach is an important source of vitamin A, vitamin C and folic acid; ghee (cow) of fat; maize (yellow dried raw) of vitamin B6; cow milk (whole, pasteurized) of vitamin B2 and vitamin B12; and baking powder of calcium.

Table 9.2.3: Gilgit livestock/poultry zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, white	579	20.7	8 978	5.3	37.4	36.0	7.0	0.0	0.0	19.1	10.6	37.0	12.2	10.2	0.0	2.9	30.8	27.1
Baking powder	12	0.4	6 450	3.8	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.2	0.0	0.0
Maize, yellow, dried, raw	186	6.6	3 714	2.2	11.9	10.8	4.6	0.9	0.0	18.5	6.9	6.0	24.7	3.3	0.0	0.8	7.4	18.4
Breastmilk	194	6.9	0	0.0	2.3	1.2	5.6	4.4	5.4	1.0	2.3	1.4	0.4	1.5	2.9	2.1	0.0	0.7
Tea, powder	6	0.2	5 006	3.0	0.4	0.8	0.0	0.0	0.0	0.0	2.2	1.1	0.5	0.6	0.0	0.3	0.2	0.3
Bengal gram, whole, dried, raw	25	0.9	4 031	2.4	1.6	3.0	1.1	0.0	0.0	1.9	2.2	2.0	2.9	4.1	0.0	2.0	3.1	2.0
Cookies (bakery)	12	0.4	3 129	1.9	1.0	0.3	1.8	0.1	0.0	0.1	0.2	0.4	0.1	0.2	0.1	0.2	0.1	0.1
Egg, chicken, domestic, cooked	88	3.2	20 450	12.2	2.9	7.8	8.6	9.1	0.0	3.8	10.7	5.8	2.6	3.6	35.4	2.3	11.7	5.9
Ghee, cow	55	2.0	7 482	4.4	9.2	0.0	40.5	15.9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0
Milk, cow, whole fat, pasteurized, UHT	328	11.7	20 994	12.5	3.8	5.9	9.0	4.7	4.6	5.2	30.5	4.0	3.7	2.5	46.1	13.0	1.0	4.5
Turmeric, dried	6	0.2	1 862	1.1	0.4	0.2	0.4	0.0	0.0	0.1	0.3	0.4	2.2	0.2	0.0	0.4	2.7	0.7
Cumin, seeds	3	0.1	1 293	0.8	0.2	0.3	0.3	0.1	0.1	0.4	0.3	0.2	0.2	0.0	0.0	1.1	1.7	0.3
Fenugreek, leaf	19	0.7	1 124	0.7	0.1	0.4	0.0	2.2	4.3	0.4	1.2	0.4	2.2	1.7	0.0	1.5	0.8	0.2
Salt	3	0.1	127	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Egg, chicken, farmed, raw	38	1.4	6 590	3.9	1.0	3.2	2.5	2.9	0.0	1.8	5.2	2.1	1.2	1.7	15.3	0.0	4.1	2.7
Onion	424	15.2	32 052	19.1	3.5	3.5	0.6	0.0	14.7	4.3	2.9	3.6	11.8	5.6	0.0	3.6	1.2	2.6
Spinach, raw	302	10.8	14 902	8.9	1.5	5.3	1.1	55.8	44.5	2.3	9.2	6.8	12.6	51.9	0.0	10.5	9.5	8.2
Spearmint leaf, raw	3	0.1	384	0.2	0.0	0.1	0.0	0.1	0.5	0.1	0.3	0.1	0.1	0.3	0.0	0.1	0.7	0.2
Oil, mustard	13	0.5	2 248	1.3	2.2	0.0	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tomato, ripe	195	7.0	18 298	10.9	0.8	1.0	0.4	3.8	25.8	3.0	3.3	2.2	3.3	2.6	0.0	0.4	1.4	0.6
Wheat, flour, brown, whole (Wheat, whole, raw)	301	10.8	9 042	5.4	19.3	19.8	6.4	0.1	0.0	37.8	11.7	26.5	19.3	10.1	0.0	4.8	20.7	25.4
Total	2 794	100	168 157	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	199	100	146	129	143	105	175	146	122	117	100	100	203

The percentage of target met is an average of the % nutrient requirements met over the year.

In the FHAB diet, the RNI for energy, fat, calcium and iron is only met by 100 per cent for the CoD family in all seasons of the year. All other nutrients exceed 100 per cent of RNI and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-15).

## 9.2.8 Seasonal fluctuations in the food habits nutritious diet

Prices are lowest in summer due to the low cost of vegetables, fruits and dairy products during this season.

## 9.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Vegetables and vegetable products are the costliest elements of the FHAB diet for the CoD family in the livestock/poultry livelihood zone of Gilgit district (Annex 3.7-15). This is because these foods are included in the diet in large quantities to meet nutrient targets, and therefore contribute the most to the cost, and yet are the least expensive. In addition, vegetables are seasonally available, with most found fresh in the summer.

In the FHAB diet for children aged 12–23 months, it is important to note the significant contribution of breastmilk to meeting nutrient requirements: 38 per cent of total energy needs, 21 per cent of protein, 69 per cent of fat, 41 per cent of vitamin A, 36 per cent of vitamin B2, 54 per cent of vitamin B12, 42 per cent of vitamin C, and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (brown, wholegrain, raw) and wheat flour (white) were selected by the software as important sources of iron.

## 9.2.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 9.2.4 shows the estimated affordability of the diets per year if non-food expenditures specific to each wealth group are applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor, poor and middle households, while the NUT diet is not affordable only for very poor households, costing only 3 per cent more than their total income.

Table 9.2.4: Gilgit livestock/poultry zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

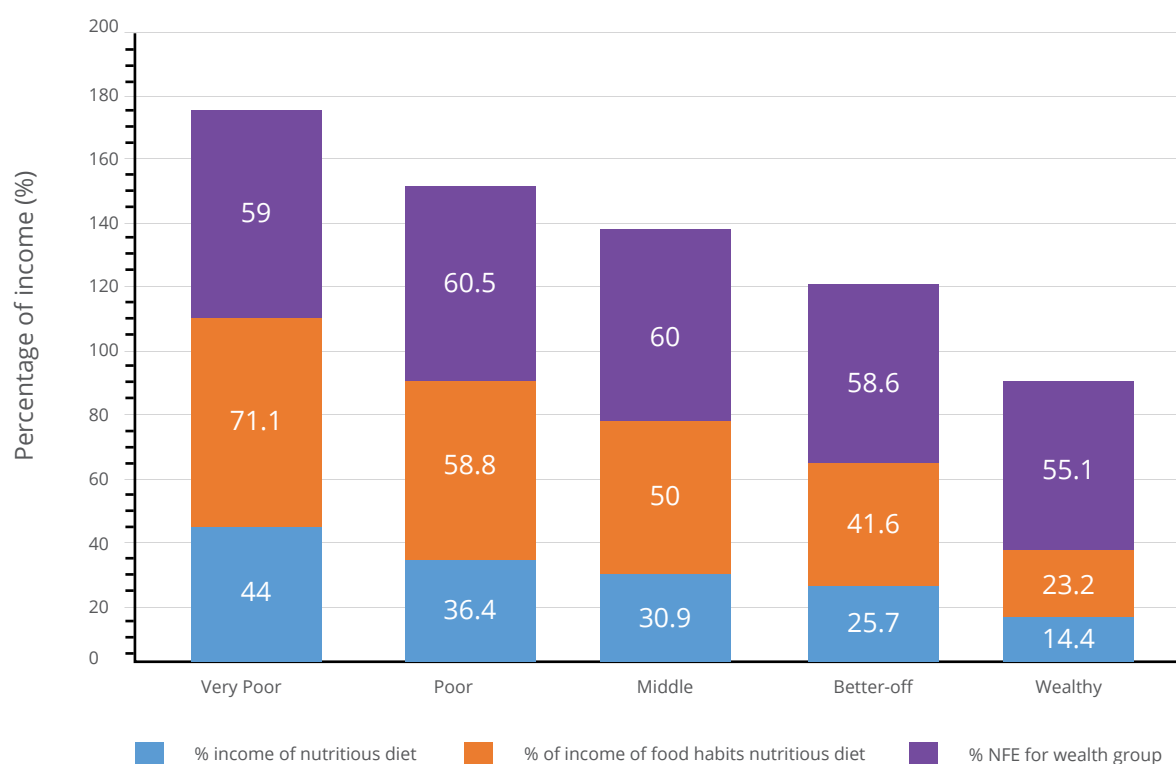
Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	104,019	44	168,157	71.1	139,830	59.0
Poor	285,912	104,019	36.4	168,157	58.8	172,927	60.5
Middle	336,240	104,019	30.9	168,157	50	201,890	60.0
Better-off	404,016	104,019	25.7	168,157	41.6	236,908	58.6
Wealthy	725,412	104,019	14.4	168,157	23.2	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 9.3.1 visually represents the affordability analysis for the five wealth groups in Gilgit's livestock/poultry livelihood zone based upon the numbers presented in Table 9.3.4 above. These show that better-off and wealthy households can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 30 per cent for very poor, 19 per cent for poor and 10 per cent for middle wealth groups respectively. The additional amount of money required

per year by these households to afford a FHAB diet plus non-food expenditure is 71,083 PKR, 55,172 PKR and 33,807 PKR respectively.

Figure 9.3.1: Gilgit livestock/poultry zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 9.3.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Gilgit district's livestock/poultry livelihood zone, and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap of a nutritious diet for very poor and poor households is 30 per cent and 19 per cent of income, respectively. The results indicate that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>16</sup> Activities could be identified through district-specific household economic approach studies.

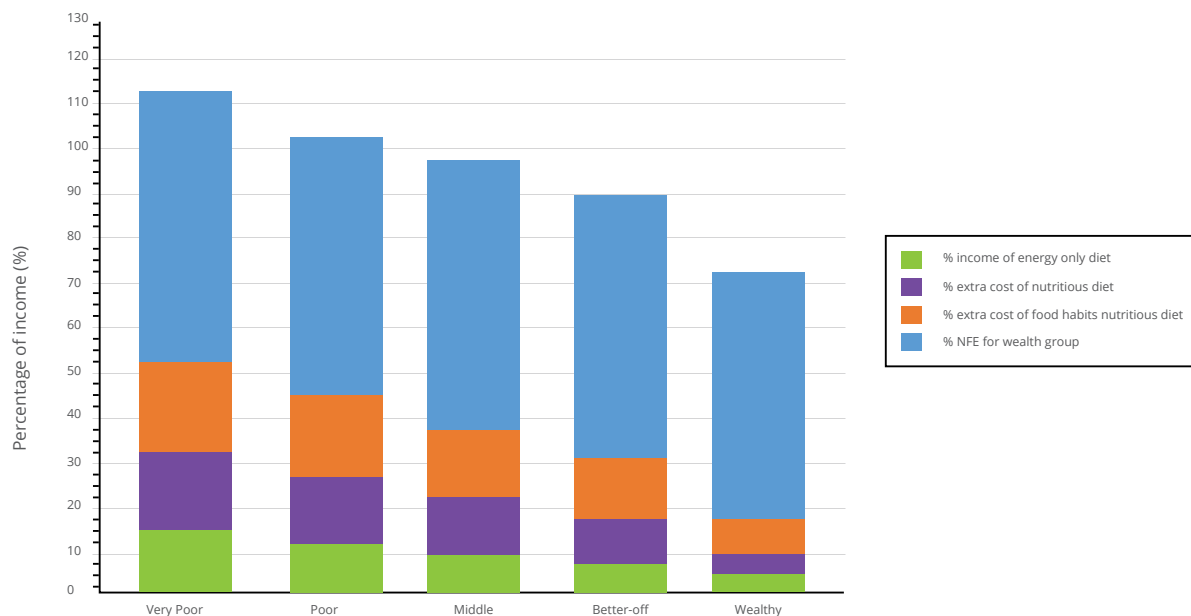
<sup>16</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.



### Model 2. The impact of self-production of vegetables in kitchen gardens on the cost, quality, composition and affordability of a FHAB diet.

The software identified vegetables and vegetable products to be the most expensive food groups in the FHAB diet. Onions and spinach were the two vegetables included by the software, contributing 28 per cent of the total annual cost of the diet. Spinach is an important source of vitamin A, vitamin C and folic acid, while onion is added to almost all dishes for flavour. This model brings down the cost of spinach and onion to zero through self-production at household level by promoting their cultivation in small kitchen gardens. It assumes provision of inputs such as vegetable seeds and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This will bring down the annual cost of the food habits nutritious diet to 113,114.20 PKR which is affordable for poor and middle households and leaves only a 7 per cent gap for the very poor. The model assumes that the additional cost could be covered by the income generated from the sale of a portion of the produce (Figure 9.3. 2).

Figure 9.3.2: Gilgit livestock/poultry zone: Affordability of EO, NUT and FHAB diets with kitchen gardening

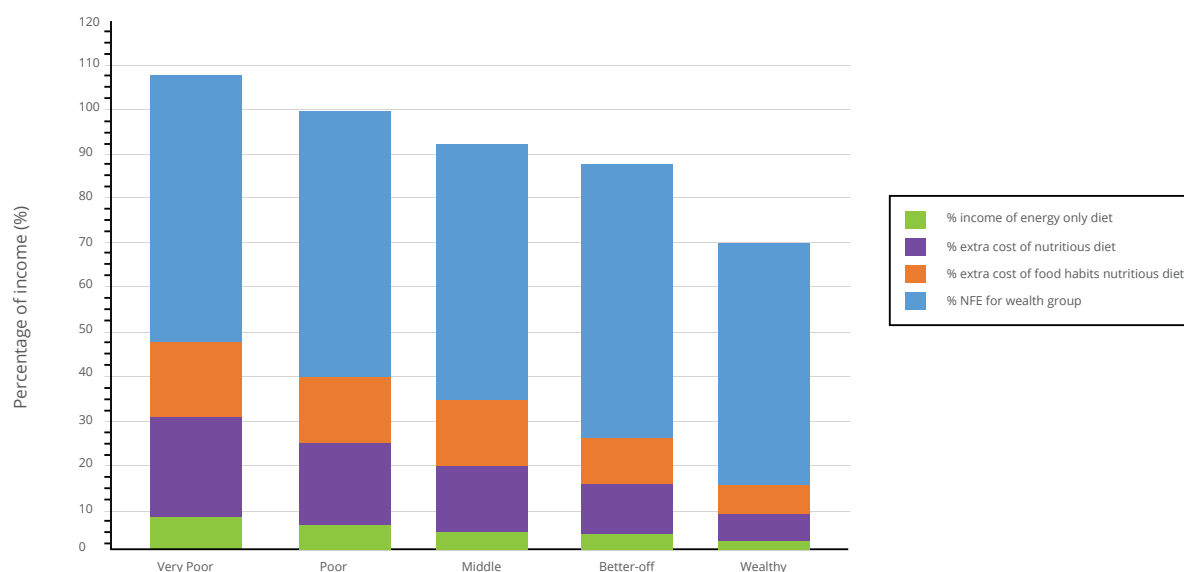


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment calculates the annual cost of the FHAB diet for a family of seven to be 168,200 PKR which is not affordable for very poor, poor and middle households. When the family size is reduced to five, the cost is significantly reduced to 124,500 PKR, which is affordable for middle households and leaves a 12 per cent and 4 per cent affordability gap for very poor and poor households respectively (Figure 9.3.3). However, a corresponding reduction in non-food expenditure is expected which will enable even the very poor to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 9.3.3: Gilgit livestock/poultry zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 9.3.12 Key findings

**The FHAB diet is approximately 6.5 times as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT diet is four times as expensive as the EO diet, meaning that it costs four times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is 6.5 times as expensive as the EO diet and 1.6 times as expensive as the NUT diet, which does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, wheat flour (brown, whole, raw) provides most of the essential micronutrients in the livestock/poultry livelihood zone of Gilgit district.**

The NUT diet, which does not consider local food habits, is hypothetical, but it gives an indication of which foods found on the local market are the least expensive and most nutritious. The software included wheat flour (brown, whole, raw) as a locally-available inexpensive source of energy, protein, vitamin B1, niacin, iron and zinc, contributing most of these nutrients. FGD participants confirmed that wheat is produced locally and consumed frequently.

**Vitamin B12, folic acid, vitamin C, calcium and iron are the hardest nutrients for the software to meet using locally-available foods.**

The software only met the RNI for vitamin B12, folic acid, vitamin C, calcium and iron by 100 per cent in the NUT diet. Thus, while the software found a solution, these nutrients are the hardest for it to meet using locally-available foods, even if local dietary preferences are not accommodated.

**The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The RNIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the NUT diet are all available in almost all markets visited and are therefore considered to be available in Gilgit's livestock/poultry livelihood zone. FGD participants also confirmed that a variety of food is available in the market, that they produce a range of vegetables, fruits and grains such as

wheat, and keep animals. Some vegetables were described as seasonal and therefore were expensive. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor and middle households cannot afford a FHAB diet.**

The comparison of total annual household income, non-food expenditure and the annual cost of the three diets indicate that very poor, poor and middle households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Beef is believed to cause damage to the developing brain in utero and is not given to pregnant women. Foods with chillies are generally said to be not good for lactating mothers.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **9.3.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor and middle households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for children aged 12–23 month.
- Some nutritionally-rich foods, such as beef, are taboo for pregnant women.

### **Recommendations**

### **Promoting vegetable cultivation in kitchen gardens can help improve quality, composition and affordability of nutritious diet.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. The model promoting self-production of key nutrient-rich vegetables, such as spinach and onion, can lower the annual cost of the FHAB diet significantly, narrowing the affordability gap for the very poor. It can also increase income and thus further improve affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in

terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis indicates that at current levels of income, if the family size is reduced to five, the affordability gap for the FHAB diet for very poor and poor households falls to 12 per cent and 4 per cent respectively. It is believed that this gap could be filled with the corresponding reduction in non-food expenditure. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 30 per cent and 19 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes would allow such households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.









**Cost of the Diet Analysis in  
Tribal Districts of KP (formerly  
known as the Federally  
Administered Tribal Areas)**



## 10.

## Cost of the Diet Analysis in Tribal Districts of KP (formerly known as the Federally Administered Tribal Areas)

### 10.1 Khyber Agency, agriculture livelihood zone

#### 10.1.1 Market survey to collect price data

Surveys were conducted in the following six villages: Ghaniza, Naha Ghazi Baba-1, New Abadi, Shah Noor Khel, Shahkas and Sultan Khel. The reference year selected for data collection was 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 November 2017 to 28 February 2018
- Season 2 (Autumn): 1 September 2017 to 31 October 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 1 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.16.

#### 10.1.2 Availability of foods in the local markets

The data collection team found 85 foods in the markets of the six villages of the agriculture livelihood zone of Khyber Agency:

- 13 types of grains and grain-based products,
- 4 types of roots and tubers,
- 8 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 1 variety of fish and seafoods,
- 2 varieties of eggs,
- 3 types of milk and milk products,
- 12 types of vegetables,
- 12 types of fruits,
- 3 types of fats/oils,
- 6 types of sugars and confectionary,
- 12 varieties of herbs, spices and condiments including salt,
- 3 types of beverages, and
- 2 composite dishes.

### 10.1.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten five or more times a week. Some of the women in the FGDs indicated that they produce wheat on their own farms while others purchase it from the market. Wheat (whole, brown) was said to be cheaper and more widely consumed than white flour which is expensive and difficult to afford. Millet is not well known and therefore not frequently consumed.

The women in the FGDs generally said they give whatever is good for pregnant women and lactating mothers within their economic limits to keep both mother and baby healthy. Milk, meat, fruits such as pomegranate were said to be given to pregnant women and lactating mothers. Pregnant women were said to avoid beans and “warm” foods which are believed to harm the foetus. Lactating mothers were said to avoid vegetables such as spinach and cucumber which are believed to harm the child.

Children aged 6–23 months are mostly fed on boiled potatoes, eggs and puddings and avoid hard foods such as pulses (including beans), meat and spicy foods which are believed to not be digestible and are considered harmful for the child.

People suffering from illness are given soft foods such as soup and chicken.

All the FGD participants in the six villages acknowledged that a variety of foods is available in the market although some are seasonal, especially fruits and vegetables. They also reported that for those who own land, self-production of wheat contributes significantly to the household diet and these households do not need to buy it from the market. Economic constraints were repeatedly cited as the cause for poor household diets. They stated they have not been receiving any support from government.

The food taboos described above indicate cost is not the only factor that influences consumption. Although they are available in the market, some foods, such as millet, are not consumed because of local dietary habits.

### 10.1.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 10.1.1).

Table 10.1.1: Khyber agriculture zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	6	4	155.24
Macronutrients diet (MAC)	Yes	7	4	155.97
Nutritious diet (NUT)	Yes	16	8	311.44
Food habits nutritious diet (FHAB)	Yes	27	10	488.21

\* Averaged across seasons.

### 10.1.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy needs is estimated to range between 150.72 PKR and 161.44 PKR per day. It features five of the 85 foods found in the markets of the six villages, excluding breastmilk. The annual cost of this diet for the typical family is estimated to be 56,700 PKR (Annex 3.1-16).

It should be noted that the cost of the diet of a child aged 12–23 months only includes solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day.

The key foods in the EO diet are vermicelli, maize (yellow, dried, raw), ghee (vegetable), sorghum and gourd (snake).

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote the diet, as people who rely on it for extended periods are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Khyber's agriculture livelihood zone across all seasons, RNIs for vitamins including vitamin A, folic acid, vitamin B1, vitamin B2, pantothenic acid, vitamin B6, vitamin B12 and vitamin C, and minerals including calcium, iron, magnesium and zinc, are not met by this diet (Annex 3.2-16).

### 10.1.6 Nutritious diet

A NUT diet that meets the average energy requirements and RNIs for micronutrients is estimated to cost a minimum of 274.75–370.91 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-16).

Table 10.1.2: Khyber agriculture zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Baking powder	16	0.7	1257	1.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.3	0.0	0.0
Bean, mung	64	2.7	8164	7.2	1.4	2.8	0.2	0.0	0.0	2.9	1.3	1.9	1.5	12.6	0.0	0.6	1.9	2.2
Maize, yellow, dried, raw	27	1.1	1039	0.9	1.7	1.5	0.6	0.2	0.0	2.4	1.0	0.8	3.8	0.5	0.0	0.1	0.9	2.3
Breastmilk	194	8.3	0	0.0	2.3	1.2	5.1	5.9	6.5	0.9	2.3	1.2	0.4	1.6	3.3	2.1	0.0	0.6
Ghee, vegetable	39	1.7	3948	3.5	6.6	0.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Carrot, raw	29	1.3	1914	1.7	0.2	0.2	0.1	5.8	0.4	0.3	0.8	0.5	0.9	0.4	0.0	0.3	0.1	0.1
Ghee, cow	42	1.8	4443	3.9	7.0	0.0	27.7	16.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.5	0.0
Gourd, snake	418	18.0	0	0.0	1.6	2.2	0.8	3.7	21.1	3.9	5.6	3.8	6.7	7.9	0.0	4.4	1.9	4.4
Sorghum, raw	132	5.7	5331	4.7	8.6	7.7	2.9	0.0	0.0	6.4	5.8	5.6	7.6	2.5	0.0	1.3	8.9	5.6
Millet, pearl, local	387	16.6	18181	16.0	26.0	25.9	12.9	2.3	0.0	23.2	29.9	30.6	25.8	11.7	0.0	6.3	36.0	31.6
Egg, chicken, farmed, raw	211	9.1	41108	36.2	5.5	17.7	12.7	21.1	0.0	9.0	28.4	10.3	7.2	10.0	96.5	0.0	18.9	13.1
Spinach, raw	179	7.7	3076	2.7	0.9	3.1	0.6	44.3	31.9	1.2	5.4	3.6	8.0	32.9	0.0	6.2	4.7	4.2
Guava, green	21	0.9	1072	0.9	0.2	0.1	0.1	0.4	40.1	1.0	0.6	0.4	0.5	1.0	0.0	0.1	0.2	0.2
Rice, brown, parboiled, home pounded, raw	54	2.3	2381	2.1	3.5	2.4	0.8	0.0	0.0	3.4	1.3	3.9	7.7	2.5	0.0	0.2	1.8	2.7
Vermicelli	128	5.5	5692	5.0	9.4	9.9	1.7	0.0	0.0	1.8	2.6	7.2	3.2	2.4	0.0	1.0	2.1	4.7
Wheat, flour, brown, whole (Wheat, whole, raw)	385	16.6	16070	14.1	24.7	25.0	7.4	0.1	0.0	43.6	14.9	30.2	26.6	13.9	0.0	6.1	22.0	28.3
Total	2326	100	113676	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	202	110	109	107	158	106	197	135	113	103	100	120	233

The percentage of target met is an average of the % nutrient requirements met over the year.

The NUT diet includes 15 of the 85 foods known to be eaten by people in Khyber's agriculture livelihood zone; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Millet (pearl, local) was selected by the software as an inexpensive and rich source of energy, protein, vitamin B2, niacin, iron and zinc, and provides the highest proportion of these nutrients in this diet. Wheat flour (whole, brown) is an inexpensive and rich source of vitamin B1 and vitamin B6, providing the highest proportion of these nutrients in the diet. Spinach is an inexpensive source of vitamin A and folic acid and provides most of these nutrients in the diet. Additionally, ghee (cow) is selected as a source of fat; guava (green) for vitamin C; egg (chicken, farm) for vitamin B12, and baking powder for calcium (Table 10.1.2).

The percentages of the RNI met for essential macro- and micronutrients by the NUT diet for the typical family in Khyber's agriculture livelihood zone are given in Annex 3.4-16. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, only about 100 per cent of the RNIs of vitamin C, vitamin B12 and calcium are met, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

### 10.1.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in Khyber's agriculture livelihood zone; the diet, however, reflects the least expensive way for the typical family to meet its energy and micronutrient needs using only foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is between 449.70–536.75 PKR per day. Lactating mothers are the most expensive family members (Annex 3.5-16).

Table 10.1.3: Khyber agriculture zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	326	13.1	35 715	20.0	20.3	21.8	4.7	0.1	0.0	36.9	19.2	32.4	25.3	9.0	0.0	6.6	20.4	29.4
Baking powder	16	0.6	1 232	0.7	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.6	0.0	0.0
Bean, mung	42	1.7	5 350	3.0	0.9	1.9	0.1	0.0	0.0	1.9	0.9	1.4	0.8	8.2	0.0	0.4	1.3	1.6
Maize, yellow, dried, raw	87	3.5	3 597	2.0	5.6	5.1	2.0	0.5	0.0	7.9	3.3	2.8	10.4	1.7	0.0	0.4	3.2	8.5
Breadstmk	194	7.8	0	0.0	2.3	1.2	5.2	4.8	6.5	0.9	2.4	1.3	0.3	1.6	2.9	2.1	0.0	0.7
Sugar, white	39	1.6	2 614	1.5	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1
Bengal gram, whole, dried, raw	25	1.0	4 210	2.4	1.6	3.0	1.0	0.0	0.0	1.7	2.3	1.9	2.5	4.3	0.0	1.9	2.8	2.0
Cookies (bakery)	14	0.6	2 557	1.4	1.2	0.4	2.0	0.1	0.0	0.1	0.2	0.5	0.2	0.2	0.2	0.1	2.5	0.2
Egg, chicken, domestic, cooked	23	0.9	6 101	3.4	0.8	2.0	2.0	2.6	0.0	0.9	2.8	1.5	0.6	1.0	9.1	0.6	2.7	1.5
Carrot, raw	29	1.2	1 878	1.1	0.2	0.2	0.1	4.6	0.3	0.3	0.8	0.5	0.7	0.4	0.0	0.3	0.1	0.1
Ghee, cow	81	3.3	9 769	5.5	13.6	0.0	55.7	25.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.0
Beef, mince, lean, raw	14	0.5	4 388	2.5	0.3	1.6	0.5	0.0	0.0	0.1	0.8	1.3	1.0	0.1	4.2	0.0	2.1	2.1
Gourd, snake	139	5.6	0	0.0	0.5	0.7	0.3	1.0	7.0	1.3	1.9	1.4	1.9	2.6	0.0	1.5	0.7	1.7
Cumin, seeds	2	0.1	2 669	1.5	0.2	0.2	0.3	0.1	0.1	0.3	0.3	0.1	0.2	0.0	0.0	0.9	1.3	0.3
Sorghum, raw	284	11.4	11 895	6.7	18.5	17.0	6.4	0.0	0.0	13.8	12.8	13.3	13.5	5.4	0.0	2.7	21.0	13.6
Chilli, green, with seeds, raw	6	0.3	3 071	1.7	0.1	0.1	0.0	0.0	5.6	0.1	0.1	0.1	0.3	0.1	0.0	0.1	0.1	0.4
Grass pea, split dried, raw	15	0.6	2 442	1.4	1.0	2.5	0.1	0.0	0.0	1.3	1.1	0.7	1.0	2.9	0.0	0.3	1.0	1.5
Salt	3	0.1	163	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maize, grain or flour, local	108	4.3	4 707	2.6	7.3	5.2	2.7	1.2	0.0	9.7	7.5	7.9	6.2	2.6	0.0	0.2	4.8	5.8
Egg, chicken, farmed, raw	209	8.4	40 644	22.8	5.4	17.9	12.9	17.0	0.0	8.9	29.0	11.4	5.9	9.9	83.5	0.0	20.6	14.7
Onion	424	17.0	21 608	12.1	3.5	3.5	0.6	0.0	17.8	3.9	2.9	3.6	10.5	6.0	0.0	3.6	1.1	2.5
Spinach, raw	209	8.4	3 618	2.0	1.0	3.7	0.7	41.9	37.0	1.4	6.5	4.7	7.8	38.4	0.0	7.2	6.0	5.6
Guava, green	13	0.5	665	0.4	0.2	0.1	0.0	0.2	25.1	0.6	0.4	0.3	0.3	0.6	0.0	0.1	0.1	0.1
Spearmint leaf, raw	3	0.1	1 086	0.6	0.0	0.1	0.0	0.1	0.5	0.1	0.3	0.0	0.1	0.3	0.0	0.1	0.6	0.2
Rice, brown, parboiled, home raw	66	2.7	2 902	1.6	4.3	3.0	1.0	0.0	0.0	4.1	1.6	5.3	7.8	3.1	0.0	0.3	2.4	3.7
Sorghum, grain or flour, local	55	2.2	2 507	1.4	3.4	3.3	0.9	0.1	0.0	3.0	1.5	3.6	1.6	0.6	0.0	0.3	2.9	1.3
Vermicelli	63	2.5	2 807	1.6	4.6	5.0	0.9	0.0	0.0	0.9	1.3	4.0	1.3	1.2	0.0	0.5	1.1	2.6
Total	2 487	100	178 195	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	196	108	134	107	158	102	176	163	113	117	100	110	206

The percentage of target met is an average of the % nutrient requirements met over the year.

Table 10.1.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food to meeting the micronutrient needs of a typical family in Khyber's agriculture livelihood zone.

Twenty-six of the 85 foods known to be eaten by people in the district are included in the FHAB diet. Among these, wheat flour (brown, wholegrain) is an important source of protein, energy, vitamin B1, niacin, vitamin B6, and zinc, providing most of these nutrients, and sorghum is an important source of iron, providing most of this nutrient in the diet. Additionally, spinach is an important source of vitamin A, vitamin C and folic acid; ghee (cow) of fat; egg (chicken, farm) of vitamin B2 and vitamin B12; and baking powder of calcium.

In the food habits diet, the RNIs are only met to 100 per cent for energy, vitamin B2 and calcium for the CoD family in all seasons of the year. All other nutrients exceed 100 per cent of RNI, and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-16).

### 10.1.8 Seasonal fluctuations in the food habits nutrition diet

The daily cost of the FHAB diet is highest in summer and lowest in spring. This is due to the high cost of egg during the hot season.

### 10.1.9 The contribution of food groups to the cost of the food habits nutritious diet

Grains and grain-based products, followed by egg, are the costliest elements of the FHAB diet (Annex 3.7-16). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to the cost of the FHAB diet, and yet are the least expensive. The price of grains is lower in summer compared to the other seasons, but the price of eggs is higher.

In the FHAB diet for children aged 12–23 month old child, it is important to note the significant contribution of breastmilk to nutrient requirements: 38 per cent of total energy needs, 53 per cent of fat, 40 per cent of vitamin A, 36 per cent of vitamin B2, 45 per cent of vitamin B12, 48 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Wheat flour (whole, brown) and spinach were selected by the software as important sources of iron.

### 10.1.10 Affordability of the diets

Estimating affordability is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimated based on multiple assumptions and variable parameters. Table 10.1.4 shows the estimated affordability of the diets per year if the non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet was not affordable for very poor, poor, middle and better-off households while even the NUT diet is not affordable for very poor households.

Table 10.1.4: Khyber agriculture zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

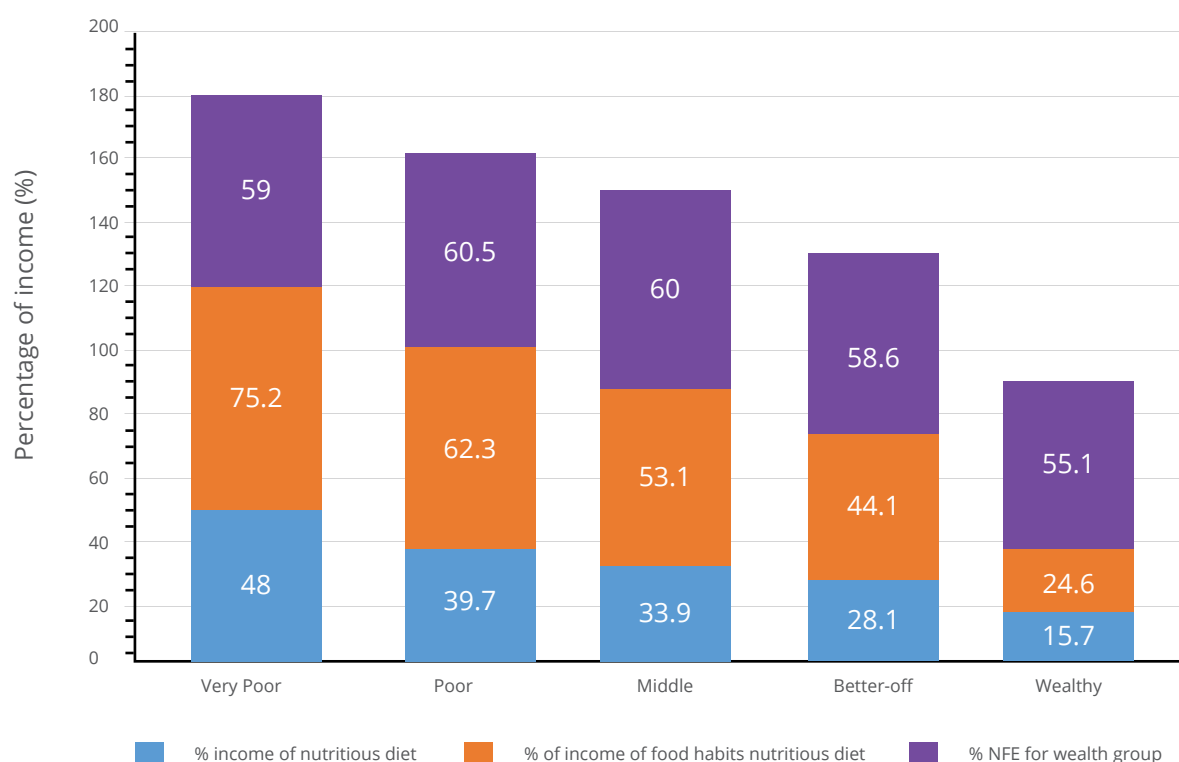
Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	113,676	48	178,195	75.2	139,830	59.0
Poor	285,912	113,676	39.7	178,195	62.3	172,927	60.5
Middle	336,240	113,676	33.9	178,195	53.1	201,890	60.0
Better-off	404,016	113,676	28.1	178,195	44.1	236,908	58.6
Wealthy	725,412	113,676	15.7	178,195	24.6	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.



Figure 10.1.1 visually represents the affordability analysis for the five wealth groups in Khyber's agriculture livelihood zone based upon the numbers presented in Table 10.1.4 above. The results show that only the wealthy can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 34 per cent for very poor, 23 per cent for poor, 13 per cent for middle and 3 per cent for better-off wealth groups. The additional amount of money required per year by these households to afford a FHAB diet plus non-food expenditure is 81,121 PKR, 65,210 PKR, 43,845 PKR and 11,087 PKR respectively.

Figure 10.1.1: Khyber agriculture zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 10.1.11 Modelling nutritional interventions

Three interventions were modelled to examine their effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

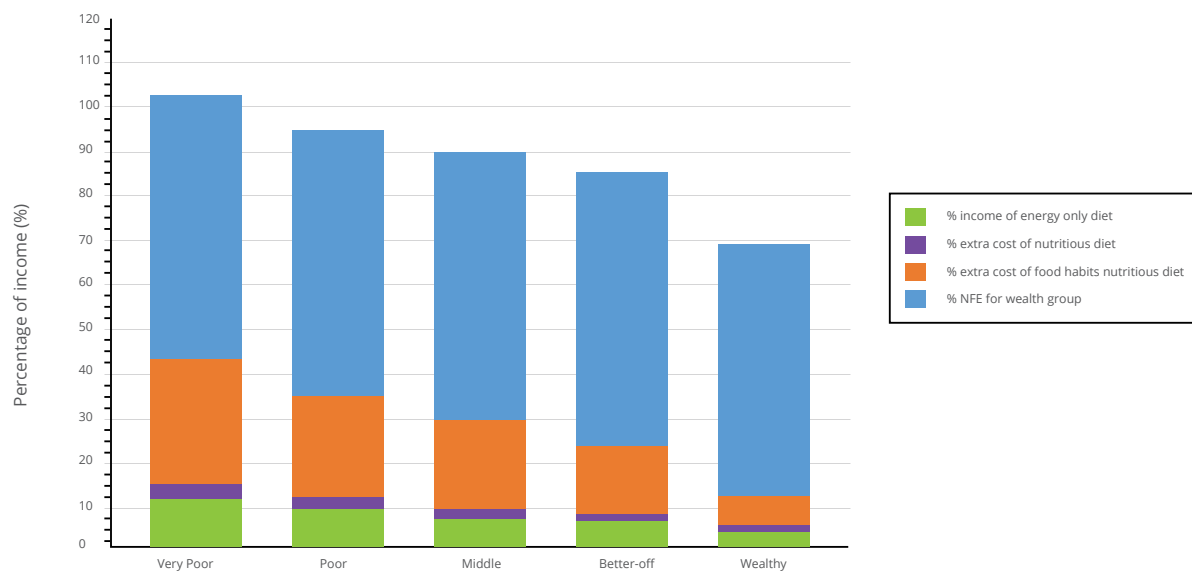
Availability of foods is not a challenge in Khyber's agriculture livelihood zone and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The affordability gap of a nutritious diet for very poor and poor households is 34 per cent and 23 per cent of income, respectively. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>17</sup> Activities could be identified through district-specific household economic approach studies.

<sup>17</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.

### Model 2. The impact of poultry farming on the cost, quality, composition and affordability of a FHAB diet.

The software identified eggs and egg products to be the second-most expensive of the food groups next to grain and grain-based foods in the FHAB diet, contributing 23 per cent of the total annual cost. Egg is an important source of protein, vitamin B2, vitamin B12, iron and zinc. This model brings down the cost of egg to zero, simulating self-production at the household level by promoting poultry farming. The model assumes provision of inputs such as chicks and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This brings down the annual cost of the FHAB diet significantly to 102,024 PKR leaving only a 2 per cent gap for very poor households (Figure 10.1.2). The model assumes this gap could be filled by additional income generated from sale of part of the produce.

Figure 10.1.2: Khyber agriculture zone: Affordability of EO, NUT and FHAB diets with poultry farming for egg production

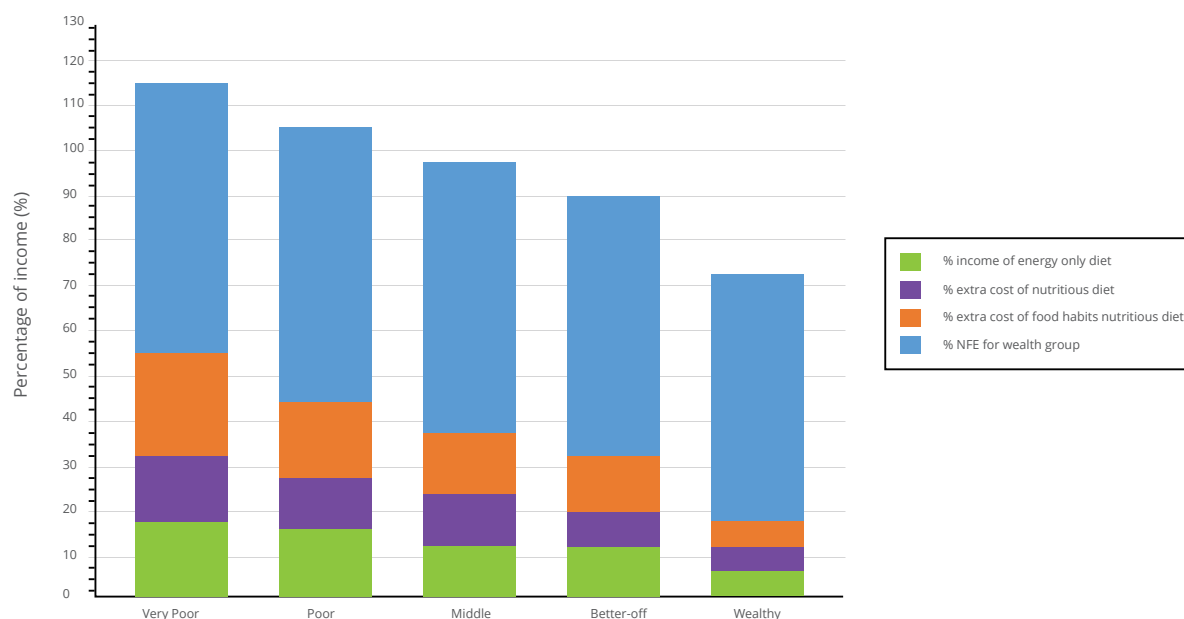


### Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

This assessment finds the annual cost of the FHAB diet for a family of seven to be 178,200 PKR which is not affordable for very poor, poor, middle and better-off households. When the family size is reduced to five, the cost is significantly reduced to 132,000 PKR, which is still not affordable for very poor and poor households, but narrows the affordability gap to 15 per cent and 7 per cent of incomes (Figure 10.1.3). A corresponding reduction in non-food expenditure is expected which will enable even very poor households to afford the FHAB diet. Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 10.1.3: Khyber agriculture zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 10.1.12 Key findings

**The FHAB diet is approximately thrice as expensive as a diet that only meets energy requirements.**

The results indicate that the NUT is twice as expensive as the EO diet, meaning that it costs twice as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is thrice as expensive as the EO diet and 1.6 times as expensive as the NUT diet which does not consider food habits. This means that the constraints applied to reflect dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, millet provides most of the essential micronutrients in Khyber's agriculture livelihood zone.**

The NUT diet, which does not consider local food habits, is hypothetical, but gives an indication of which foods found on the local market are the least expensive and most nutritious. The software identifies millet (pearl, local) and guava (green) as inexpensive and rich source of nutrients. Millet is included as a locally-available inexpensive source of energy, protein, vitamin B2, niacin, iron and zinc, contributing most of these nutrients in the diet, while guava (green) is selected as an inexpensive and rich source of vitamin C. However, FGD participants indicated that millet is not frequently consumed.

**Vitamin B12, vitamin C and calcium are the hardest nutrients for the software to meet using locally-available foods.**

The software only met the RDIs for vitamin B12, vitamin C and calcium by 100 per cent in the NUT diet. Thus, while software has found a solution, these nutrients are the hardest to meet using locally-available foods, even if local dietary preferences are not accommodated.

### **The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software has shown that the RDIs of energy, protein, fat, all the nine vitamins and the four minerals can be met using foods available in the local market. The foods selected by the software for the NUT diet are all available in almost all the markets visited and are therefore considered to be available in Khyber's agriculture livelihood zone. FGD participants also confirmed that a variety of food is available in the market but are limited by economic status. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor, poor, middle and better-off households cannot afford a FHAB diet.**

The comparison of the total annual household income, non – food expenditure and the annual cost of the three diets indicates that very poor, poor, middle and better-off households cannot afford the FHAB diet. This is because the software considers typical dietary habits such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive in order to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. Some vegetables, such as spinach and cucumber, are taboo for breastfeeding mothers as they are believed to make the child ill. Beans and foods described to have a “warm” effect are believed to harm both mother and foetus and are therefore taboo for pregnant women.

### **Breastmilk significantly contributes to the energy, protein, fat and micronutrient needs of the child aged 12–23 months.**

The CoD study indicates that breastmilk provides a significant proportion of the energy, protein, fat, vitamin A, vitamin B2, niacin, vitamin B12, vitamin C, calcium and zinc requirements of children aged 12–23 months.

## **10.1.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor, poor, middle and better-off households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for a child aged 12–23 months.
- Local dietary habits restrict the consumption of some nutritious and inexpensive foods such as millet (pearl, local) and guava (green.)

### **Recommendations**

### **Dietary modification is needed to improve quality, composition and affordability of a nutritious diet.**

The CoD analysis indicates that millet (pearl, local) and guava (green) are good sources of macro- and micronutrients at minimum cost but are not frequently consumed and are therefore not included in the FHAB diet. Promoting the

frequent consumption of these foods through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care lactating mothers require in terms of increasing the amount, frequency and variety of foods.

### **Promoting poultry farming can help improve quality, composition and affordability of a nutritious diet.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that poultry farming can lower the annual cost of the FHAB diet, making it affordable for poor households and leaving only a 2 per cent gap for the very poor. It also increases income and thus further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby enabling child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. CoD modelling indicates that at current levels of income, some poor households can afford a nutritious diet if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of a nutritious diet.**

The affordability gap for the FHAB diet is 34 per cent and 23 per cent of income for very poor and poor households, respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes for these households would allow them to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.

## 10.2 Khyber Agency, employment/labour (paid/unpaid) livelihood zone

### 10.2.1 Market survey to collect price data

Surveys were conducted in the following six villages: Ash Khel, Bakara, Gundikaly-1 (Ghundai), Landi Kotal (Ghagra), Tedi Bazar and Zakria Masjid. The reference year selected for data collection was 1 March 2017 to 28 February 2018. Seasons in this livelihood zone were identified to be:

- Season 1 (Winter): 1 November 2017 to 28 February 2018
- Season 2 (Autumn): 1 September 2017 to 31 October 2017
- Season 3 (Summer): 1 May 2017 to 31 August 2017
- Season 4 (Spring): 1 March 2017 to 30 April 2017

An account of the methodology used for the market survey is provided in section 2.2.2.

The list of all foods found in the markets, the price per 100g, and the food habits diet minimum and maximum constraints for each food item can be found in Annex 1.17.

#### 10.2.2 Availability of foods in the local markets

The data collection team found 89 foods in the markets of the six villages of the Khyber's employment/labour (paid/unpaid) livelihood zone:

- 14 types of grains and grain-based products,
- 4 types of roots and tubers,
- 7 types of legumes, nuts and seeds,
- 4 varieties of meat and offal,
- 3 varieties of fish and seafoods,
- 2 varieties of eggs,
- 3 types of milk and milk products,
- 13 types of vegetables,
- 12 types of fruits,
- 3 types of fats/oils,
- 7 types of sugars and confectionary,
- 14 varieties of herbs, spices and condiments including salt, and
- 3 types of beverages.

### 10.2.3 Typical food consumption habits and food taboos

The interviews and FGDs showed that wheat is the staple food in the assessment area and is eaten five or more times a week. The women in the FGDs indicated that they used to have farms which have been taken by the government and buildings have been constructed due to urbanization. For this reason, they no longer produce wheat as they once used to, and have become more dependent on the market for staple foods. Sorghum and millet are not well known and are therefore not consumed frequently.

The women generally said pregnant women eat meat, beans, fruits and green vegetables. They avoid hard and sour foods that are believed to harm the mother and foetus, and foods described as having a "warm" effect such as the spice ajwain (carom). Lactating mothers were said to eat milk, meat and fruits such as apple to increase breastmilk production.



Children aged 6–23 months are mostly fed soft foods such as potatoes, mashed bread, cereals and rice. Lentils, hard vegetables and meat were said to be not good for the health of these children.

People suffering from illness are given soups and fruit juices such as apple and banana.

All the FGD participants in the six villages acknowledged that a variety of foods are available in the market although some are seasonal, especially fruits and vegetables. They also reported that households keep chickens for eggs and meat, however, they no longer produce wheat due to the lack of land.

The food taboos described above indicate cost is not the only factor that influences consumption. Although they are available in the market, some of the foods described above are not consumed because of local dietary habits.

#### 10.2.4 The cost of the diets

The four diets calculated by the software (see section 2.4.3 above) build upon each other incrementally, refining their nutrient targets and placing restrictions on the frequency with which foods are eaten to create a mixture of foods that is more typical of a diet. The cost of these diets usually increases as additional nutrient targets are met and constraints are imposed on the frequency with which foods are eaten.

The EO diet is usually expected to be the least expensive diet as it only needs to meet the targets for energy, while the FHAB diet is usually the most expensive diet because all nutrient targets are met and constraints are imposed on the amounts and frequency with which foods are consumed to create a mixture that resembles typical food habits in the location of the assessment (Table 10.2.1).

Table 10.2.1: Khyber employment/labour (paid/unpaid) zone: Average daily cost of four CoD diets

	Requirements met	No. of foods selected	No. of food groups selected	Average daily cost (PKR)*
Energy-only diet (EO)	Yes	4	2	148.29
Macronutrients diet (MAC)	Yes	5	3	151.03
Nutritious diet (NUT)	Yes	11	7	292.01
Food habits nutritious diet (FHAB)	Yes	18	10	334.60

\* Averaged across seasons.

#### 10.2.5 Energy-only diet

The minimum cost of a diet that meets only a household's energy need is estimated at 137.57–154.86 PKR per day and features three of the 89 foods found in the markets of the six villages excluding breastmilk. The annual cost of the diet for the typical family is estimated to be 54,100 PKR (Annex 3.1-17).

It should be noted that the cost of the diet of the child aged 12-23 months only includes solid and semi-solid complementary foods; it does not include breastmilk, which is costed within the average extra energy and nutrients required by the lactating mother each day.

The key foods in the EO diet selected by the software are wheat flour (brown, wholegrain), maize (yellow, dried, raw) and sorghum.

Although the EO diet meets the RNI for energy and fat by design, it lacks several essential micronutrients. The purpose of calculating the EO diet is not to promote the diet, as people who rely on it for an extended period are likely to suffer from undernutrition, mainly stunting. However, it helps to appreciate the additional cost of meeting all nutrient specifications, including micronutrients, in addition to energy, when other diets are calculated. For the CoD family in Khyber's employment/labour (paid/unpaid) livelihood zone across all seasons, RNIs for fat, vitamins including vitamin A, folic acid, vitamin B2, vitamin B12, and vitamin C, and minerals including calcium, are not met by this diet (Annex 3.2-17).

### 10.2.6 Nutritious diet

A NUT diet that meets the average energy requirements and the RNIs for micronutrients is estimated to cost a minimum of 289.07–293.57 PKR per day, depending on the season. Lactating mothers are the most expensive family members and their increased nutritional requirements are difficult to meet, rendering them vulnerable to undernutrition (Annex 3.3-17).

The NUT diet includes 10 of the 89 foods known to be eaten by people in Khyber's employment/labour (paid/unpaid) livelihood zone; however, some of these foods would have to be eaten in large quantities, i.e. thrice daily, which is impractical. Sorghum was selected by the software as an inexpensive and rich source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, and provides the highest proportion of these nutrients in this diet; spinach was selected as an inexpensive source of vitamin A, vitamin C and folic acid and provides most of these nutrients in the diet; ghee (cow) was selected as an inexpensive and rich source of fat; egg (chicken, farm) was selected as an inexpensive and rich source of vitamin B12, and baking powder was selected as an inexpensive and rich source of calcium (Table 10.2.2).

The percentages of the RNI met for the essential macro- and micronutrients by the NUT diet for the typical family in Khyber's employment/labour (paid/unpaid) livelihood zone are given in Annex 3.4-17. These show that foods available in the local markets can provide these nutrients in sufficient quantities unless restricted by local dietary habits. However, vitamin B12, vitamin C and calcium needs are only met to 100 per cent of RNI, signifying that the software found these nutrients to be the hardest to meet using locally-available foods.

Table 10.2.2: Khyber employment/labour (paid/unpaid) zone: Absolute weight and cost of foods selected for the family for the whole year for the NUT diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	186	9.1	7 178	6.7	11.6	12.4	2.9	0.0	0.0	24.5	10.5	19.7	17.2	5.2	0.0	3.7	9.5	17.2
Baking powder	16	0.8	2 075	1.9	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	71.2	0.0	0.0
Maize, yellow, dried, raw	7	0.3	252	0.2	0.4	0.4	0.2	0.0	0.0	0.7	0.3	0.2	1.0	0.1	0.0	0.0	0.2	0.7
Breastmilk	194	9.5	0	0.0	2.3	1.2	5.6	4.3	7.0	1.1	2.3	1.4	0.4	1.6	3.4	2.1	0.0	0.7
Ghee, cow	67	3.3	7 572	7.1	11.3	0.0	49.6	19.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0
Sorghum, raw	855	41.9	30 028	28.2	55.7	50.9	20.8	0.0	0.0	48.4	36.9	42.8	48.6	16.4	0.0	8.2	51.6	41.8
Fennel, seeds	1	0.1	214	0.2	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.5	0.2	0.1
Millet, pearl, local	164	8.0	7 799	7.3	11.0	11.2	6.0	0.7	0.0	11.5	12.5	15.4	10.8	5.0	0.0	2.7	13.6	15.5
Egg, chicken, farmed, raw	205	10.1	39 237	36.8	5.3	17.5	13.6	15.1	0.0	10.2	27.3	11.9	7.0	9.8	96.5	0.0	16.5	14.8
Spinach, raw	330	16.2	11 298	10.6	1.6	5.8	1.2	60.2	62.8	2.7	9.8	7.9	14.6	61.2	0.0	11.4	7.7	9.0
Guava, green	15	0.7	932	0.9	0.2	0.1	0.1	0.2	30.2	0.8	0.4	0.3	0.4	0.7	0.0	0.1	0.1	0.1
Total	2 041	100	106 583	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
% target met					100	198	100	148	100	136	107	165	137	112	100	100	135	201

The percentage of target met is an average of the % nutrient requirements met over the year.

### 10.2.7 Food habits nutritious diet

The NUT diet specified above was not chosen to be typical of the foods eaten by people in Khyber's employment/labour (paid/unpaid) livelihood zone; the diet but reflects the least expensive way for the typical family to meet its energy and micronutrient needs using all foods available in the market, but in unconstrained amounts. To develop a more realistic model that imposes a ceiling on the number of times a specific food is repeated, we turn to the FHAB diet.

The estimated minimum amount of cash that a family of seven would need to be able to purchase the FHAB diet from the market is 332.24–337.35 PKR per day. As with the NUT diet above, lactating mothers are the most expensive family members (Annex 3.5-17).

Table 10.2.3 shows the absolute weight and cost of the foods for the whole year with the percentage contributed by each food in terms of weight, cost, energy, protein and fat; and the percentage contribution of each food for eight vitamins and four minerals for the typical family.

Seventeen of the 89 foods known to be eaten by people in the district were included in the FHAB diet. Among these, wheat flour (brown, wholegrain) is an important source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc, providing most of these nutrients; spinach is an important source of vitamin A, vitamin C and folic acid, providing most of these nutrients in the diet; ghee (cow) provides fat; egg (chicken, farm) provides vitamin B12, and baking powder is an important source of calcium, providing most of this nutrient in the diet.

In the FHAB diet, the RNI for energy, fat and calcium is only met by 100 per cent. All other nutrients exceed 100 per cent of RNI and there is no nutrient that is difficult to obtain from foods found locally (Annex 3.6-17).

Table 10.2.3: Khyber employment/labour (paid/unpaid) zone: Edible weight and cost of foods selected for the family for the whole year for the FHAB diet with percentage contributions in terms of weight, cost, energy, protein, fat and micronutrients, and percentage of total requirements met, averaged across seasons

Food list	Quantity (kg)	% quantity	Cost (PKR)	% cost	% energy	% protein	% fat	% vit A	% vit C	% vit B1	% vit B2	% niacin	% vit B6	% folic acid	% vit B12	% calcium	% iron	% zinc
Wheat, flour, brown, wholegrain, raw	566	27.3	21 835	17.9	35.2	36.2	8.7	0.1	0.0	55.1	31.5	52.0	41.1	15.6	0.0	11.4	31.7	43.7
Baking powder	16	0.8	1 996	1.6	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.5	0.0	0.0
Maize, yellow, dried, raw	185	8.9	7 042	5.8	11.8	10.4	4.6	0.9	0.0	14.3	6.7	5.5	20.5	3.5	0.0	0.8	6.0	15.4
Breastmilk	194	9.4	0	0.0	2.3	1.2	5.6	4.3	6.8	0.8	2.2	1.2	0.3	1.6	3.1	2.1	0.0	0.6
Tea, powder	6	0.3	3 668	3.0	0.4	0.7	0.0	0.0	0.0	0.0	2.1	1.0	0.4	0.6	0.0	0.3	0.2	0.3
Cookies (bakery)	15	0.7	2 676	2.2	1.3	0.4	2.3	0.1	0.0	0.1	0.2	0.5	0.2	0.2	0.2	0.1	2.3	0.1
Egg, chicken, domestic, cooked	5	0.3	1 480	1.2	0.2	0.5	0.5	0.5	0.0	0.2	0.6	0.3	0.1	0.2	2.3	0.1	0.6	0.3
Ghee, cow	71	3.4	7 931	6.5	11.8	0.0	51.9	20.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0
Beef, mince, lean, raw	16	0.8	5 155	4.2	0.4	1.8	0.6	0.0	0.0	0.1	0.8	1.4	1.1	0.1	5.2	0.1	2.1	2.1
Cumin, seeds	1	0.1	1 183	1.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.4	0.5	0.1
Sorghum, raw	391	18.9	13 742	11.3	25.5	22.4	9.5	0.0	0.0	16.3	16.7	17.0	17.5	7.4	0.0	3.8	25.9	16.0
Salt	3	0.2	89	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fennel, seeds	1	0.1	292	0.2	0.1	0.1	0.2	0.0	0.0	0.1	0.2	0.3	0.1	0.0	0.0	0.7	0.3	0.1
Egg, chicken, farmed, raw	208	10.0	39 700	32.5	5.4	17.1	13.8	15.2	0.0	7.6	27.3	10.5	5.5	9.9	89.1	0.0	18.3	12.5
Spinach, raw	322	15.6	11 090	9.1	1.6	5.4	1.2	58.4	59.8	1.9	9.5	6.7	11.2	59.4	0.0	11.2	8.3	7.4
Guava, green	16	0.8	1 046	0.9	0.2	0.1	0.1	0.2	32.9	0.7	0.5	0.3	0.3	0.8	0.0	0.1	0.1	0.1
Spearmint leaf, raw	2	0.1	822	0.7	0.0	0.0	0.0	0.1	0.4	0.0	0.2	0.0	0.1	0.2	0.0	0.1	0.4	0.1
Sorghum, grain or flour, local	54	2.6	2 382	2.0	3.4	3.1	1.0	0.1	0.0	2.6	1.4	3.3	1.5	0.6	0.0	0.3	2.5	1.1
Total	2 073	100	122 129	100	100	100	100	100	100	184	109	191	174	113	100	100	100	100
% target met					100	205	100	149	103	100	100	100	100	110	100	100	123	240

The percentage of target met is an average of the % nutrient requirements met over the year.

### 10.2.8 Seasonal fluctuations in the food habits nutritious diet

The daily cost of the FHAB diet is nearly the same throughout the four seasons, with no major fluctuation.

### 10.2.9 The contribution of food groups to the cost of the food habits nutritious diet

Grains and grain-based products, followed by egg, are the costliest elements of the FHAB diet in Khyber's employment/labour (paid/unpaid) livelihood zone (Annex 3.7-17). This is because these foods are included in the diet in large quantities to meet nutrient targets and therefore contribute the most to its cost, while being the least expensive. The price of grains is relatively lower and of egg relatively higher in summer compared to the other seasons.

In the FHAB diet for children aged 12–23 months, breastmilk makes a significant contribution to meeting nutrient requirements: 38 per cent of total energy needs, 23 per cent of protein, 69 per cent of fat, 43 per cent of vitamin A, 35 per cent of vitamin B2, 57 per cent of vitamin B12, 56 per cent of vitamin C and 30 per cent of calcium. Breastmilk contains little iron and so it is important that iron-rich complementary foods are given to the child. Sorghum and wheat flour (brown, wholegrain) were selected by the software as important sources of iron.

### 10.2.10 Affordability of the diets

Estimating the affordability of the diet is important to determine whether poverty could be preventing households from obtaining a sufficiently nutritious diet. An estimate of the gap between household income and the cost of the diet can inform social protection and cash transfer programmes. In this assessment, we make reference to HIES 2015–2016 for household incomes and the proportions of food and non-food expenditure.

To calculate affordability, the cost of each diet plus essential non-food expenditure is subtracted from the total income. These are all estimates based on multiple assumptions and variable parameters. Table 10.2.4 shows the estimated affordability of the diets per year if non-food expenditure specific to each wealth group is applied to the cost of the three diets calculated in this analysis. The table indicates that the FHAB diet is not affordable for very poor and poor households while the NUT diet is not affordable only for very poor households.

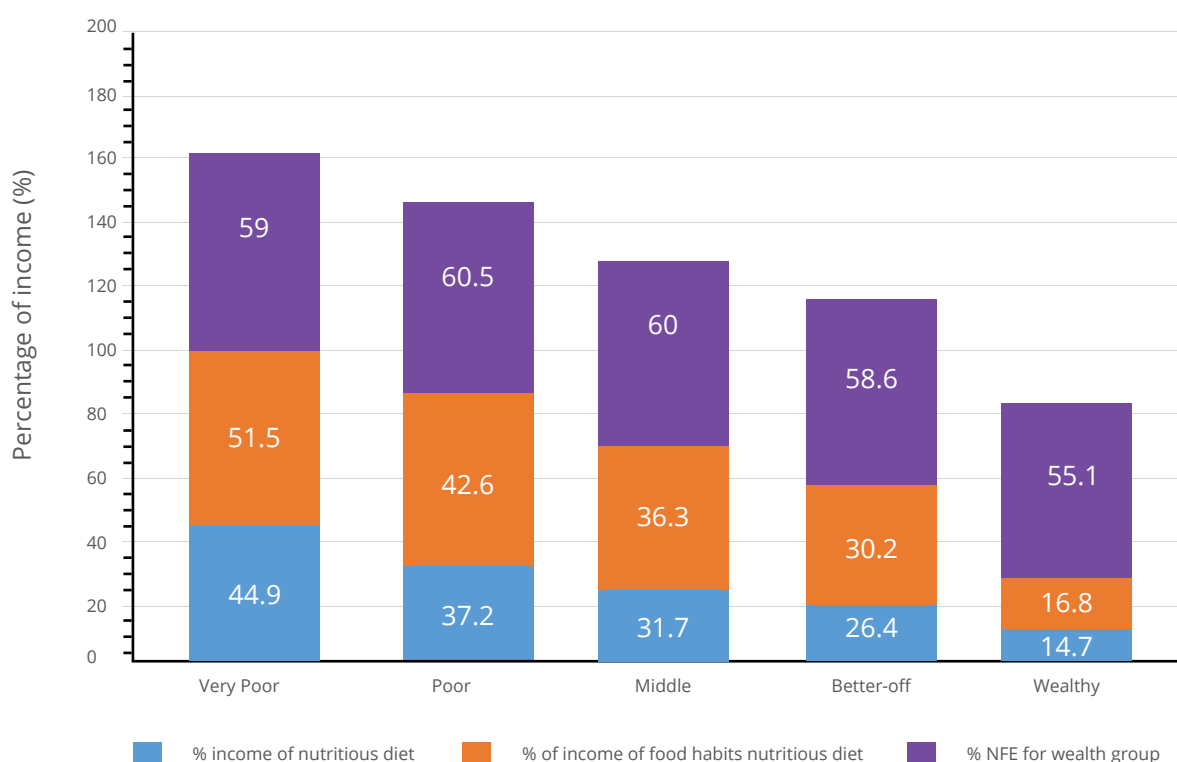
Table 10.2.4: Khyber employment/labour (paid/unpaid) zone: Estimated incomes, non-food expenditure and costs of NUT and FHAB diets

Wealth group	Annual income	NUT diet		FHAB diet		Non-food expenditure	
		Annual cost	% of income	Annual cost	% of income	Annual expenditure	% of income
Very poor	236,904	106,583	44.9	122,129	51.5	139,830	59.0
Poor	285,912	106,583	37.2	122,129	42.6	172,927	60.5
Middle	336,240	106,583	31.7	122,129	36.3	201,890	60.0
Better-off	404,016	106,583	26.4	122,129	30.2	236,908	58.6
Wealthy	725,412	106,583	14.7	122,129	16.8	399,977	55.1

Source: income and non-food expenditure figures from HIES 2015–2016.

Figure 10.2.1 visually represents the affordability analysis for the five wealth groups in Khyber's employment/labour (paid/unpaid) livelihood zone based upon the numbers presented in Table 10.2.4 above. The results show that middle, better-off and wealthy households can afford a FHAB diet plus expenditure on non-food items such as housing and utilities, clothing, healthcare and transport. The affordability gap expressed as a percentage of income is 11 per cent for very poor and 3 per cent for poor households, respectively. The additional amount of money required per year by these households to afford a FHAB diet plus non-food expenditure is 25,055 PKR and 9,144 PKR respectively.

Figure 10.2.1: Khyber employment/labour (paid/unpaid) zone: Cost of NUT diet, FHAB diet and non-food expenditure as percentage of income



### 10.2.11 Modelling nutritional interventions

Three interventions were modelled to examine the effects on the composition and cost of the diet.

#### Model 1. The impact of cash transfer, cash for work or other social safety net programmes on improving affordability of a FHAB diet.

Availability of foods is not a challenge in Khyber Agency and the markets where the very poor and poor purchase their foods are full of nutritious options. The cost of some foods, however, is very high and contributes to a significant proportion of the overall cost of the diet. The analysis found that the affordability gap for a FHAB diet for the very poor is 13 per cent of income. This suggests that current consumption patterns are unlikely to change unless income is increased. The income gap could be filled through cash transfers, food vouchers, cash for work programmes or income-generating activities that are relevant to the district.<sup>18</sup> Activities could be identified through district-specific household economic approach studies.

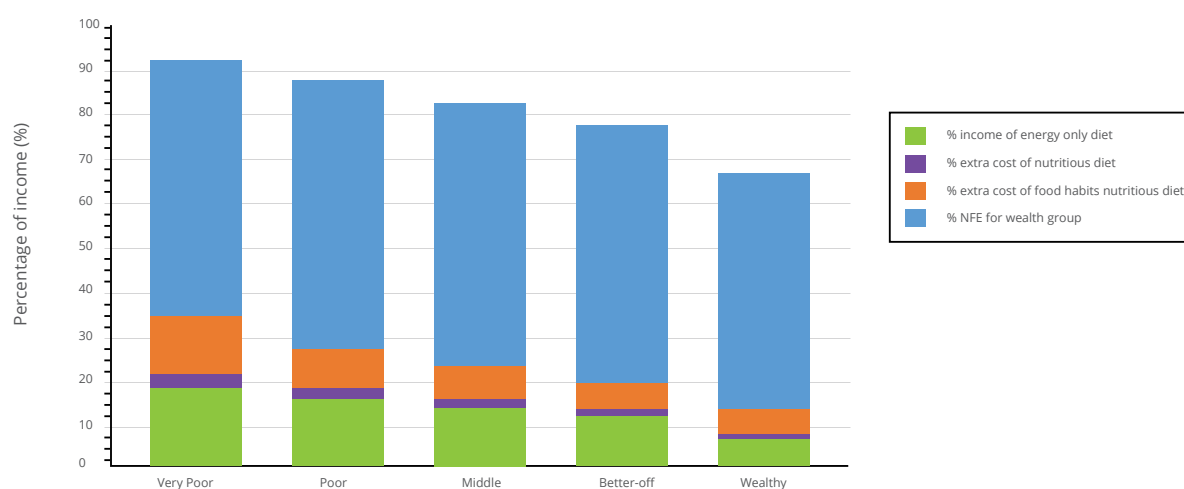
<sup>18</sup> However, the limitations of the CoD study with respect to social protection as well as the findings of new research, such as the REFANI Pakistan study (see [https://www.actionagainsthunger.org/sites/default/files/publications/REFANI\\_Pakistan\\_Update\\_final\\_8\\_2018.pdf](https://www.actionagainsthunger.org/sites/default/files/publications/REFANI_Pakistan_Update_final_8_2018.pdf)), on the variable impacts of different cash transfer programmes on nutritional status, should be taken into account.



## Model 2. The impact of poultry farming on the cost, quality, composition and affordability of a FHAB diet.

The software identified eggs and egg products to be the second-most expensive food group after grain-based foods in the FHAB diet, but they contribute 33 per cent of its total annual cost. Egg is an important source of protein, vitamin B2 and vitamin B12. The model brings down the cost of egg to zero to simulate self-production at household level by promoting poultry farming. The current model assumes provision of inputs such as chicks and training to households at the start of the programme. Households can consume their produce and sell part of it to generate income. This brings down the annual cost of the FHAB diet significantly to 80,200 PKR, making it affordable even for very poor households (Figure 10.2.2).

Figure 10.2.2: Khyber employment/labour (paid/unpaid) zone: Affordability of EO, NUT and FHAB diets with poultry farming

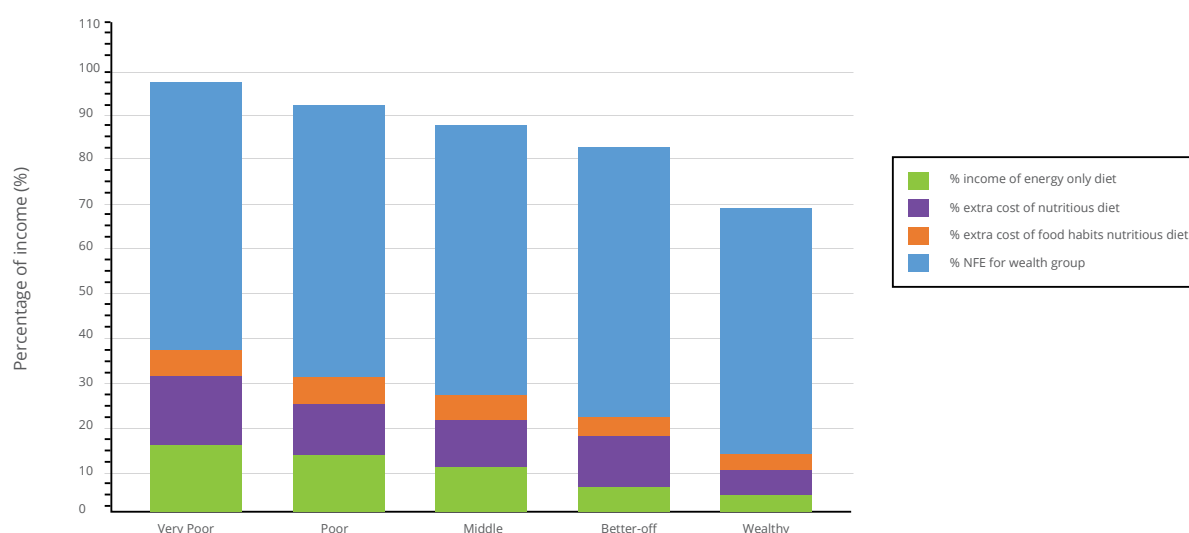


## Model 3. The impact of family planning programmes on the cost, quality, composition and affordability of a FHAB diet.

The average family size in the lowest quintiles (very poor, poor and middle) is 7–8 persons, and household size decreases as wealth increases to around 5–6 for the fifth and fourth quintiles respectively (HIES 2015–2016).

The annual cost of the FHAB diet is significantly reduced from the current 122,100 PKR for a family of seven, which is not affordable for very poor and poor households, to 90,600 PKR for a typical family of five. This is affordable even for very poor households (Figure 10.2.3). Therefore, addressing unmet family planning needs using modern contraceptive methods and behaviour change communication strategies will have nutritional implications by reducing the cost and improving the quality and composition of foods consumed by the household.

Figure 10.2.3: Khyber employment/labour (paid/unpaid) livelihood zone: Affordability of EO, NUT and FHAB diets for a household size of five



### 10.2.12 Key findings

**The food habits nutritious diet is 2.3 times as expensive than a diet that only meets energy requirements.**

The results indicate that the NUT diet is twice as expensive as the EO diet, meaning that it costs twice times as much money to meet recommended protein, fat and micronutrient requirements compared with only meeting energy requirements. The FHAB diet is 2.3 times as expensive as the EO diet and 1.1 times as expensive as the NUT diet which does not consider food habits. This means that the constraints applied to reflect typical dietary habits have required the software to add more expensive foods to meet the RNIs of the typical CoD family.

**In a NUT diet, sorghum provides most of the essential micronutrients in Khyber's employment/labour (paid/unpaid) livelihood zone.**

The NUT diet, which does not consider local food habits, is hypothetical, but gives an indication of which foods found on the local market are the least expensive and most nutritious. These include sorghum as a locally-available inexpensive source of energy, protein, vitamin B1, vitamin B2, niacin, vitamin B6, iron and zinc. However, according to FGD participants, sorghum is not frequently consumed.

**Vitamin B12, vitamin C and calcium are the hardest nutrients for the software to meet using locally-available foods in Khyber's employment/labour (paid/unpaid) livelihood zone.**

The software met specifications for vitamin B12, vitamin C and calcium only by 100 per cent of RNI in the NUT diet. While a solution was found, these nutrients are thus the hardest for the software to meet using locally-available foods, even if local dietary preferences are not accommodated.

**The availability of nutrient-rich foods is not a key barrier to poor households obtaining a nutritious diet.**

The software identified that the recommended intakes of energy, protein, fat, all nine vitamins and four minerals can be met using foods available in the local market. No mineral or vitamin has been met at less than 100 per cent RNI using foods from the local markets. The foods selected by the software were all available in almost all the markets visited and are therefore considered to be available in this livelihood zone.

FGD participants also confirmed the availability of a variety of food in the market, and are instead limited by economic capacity. This finding suggests that economic constraints and cultural practices are exacerbating poor dietary diversity in the assessment area.

### **Very poor and poor households cannot afford an FHAB diet.**

The comparison of total annual household income, non-food expenditure and the annual cost of the three diets indicates that very poor and poor households cannot afford the FHAB diet. This is because the software considers typical dietary habits, such as the main staple consumed, the frequency with which foods are eaten, and food taboos, and therefore selects foods that are more expensive to comply with local dietary habits.

### **Some nutritious foods are taboo for pregnant women and lactating mothers.**

Food consumption depends not only on affordability but also local traditions and culture. FGD participants indicated that foods that are believed to have “warm effect” are generally not given to pregnant women. Meat is not given to children aged 6–23 months as it is believed they cannot digest it.

### **Breastmilk significantly contributes to the energy, fat and micronutrient needs of children aged 12–23 months.**

The CoD study indicates that breastmilk significantly contributes to the energy, protein, fat, vitamin A, vitamin B2, vitamin B12, vitamin C and calcium requirements of children aged 12–23 months.

## **10.2.13 Conclusions and recommendations**

### **Conclusions**

- The CoD analysis reveals that although nutritious food is available in the local markets, very poor and poor households cannot afford the FHAB diet given their dietary habits and level of income.
- Lactating mothers are the most expensive members of the family because of their increased energy and micronutrient requirements.
- The analysis also shows the importance of breastfeeding with appropriate complementary feeding for children aged 12–23 months.
- Some food taboos are reported, which indicates that interventions based on food or nutrients alone will be insufficient to ensure a nutritious diet.

### **Recommendations**

#### **Dietary modification is needed to improve quality, composition and affordability of nutritious diets.**

The CoD analysis indicates that sorghum is a good source of macro- and micronutrients at minimum cost, however, it is not frequently consumed and therefore not included in the FHAB diet. Promoting the frequent consumption of sorghum through social and behavioural change communication strategies is necessary. It is also important to bring to the attention of the family the care lactating mothers require in terms of increasing the amount, frequency and variety of foods.

#### **Promoting poultry farming help improve quality, composition and affordability of nutritious diets.**

Economic constraints are among the main limiting factors for households in accessing nutritious diets. Livelihood opportunities need to be created to increase income and improve nutrition outcomes. CoD modelling shows that promoting poultry farming can lower the annual cost of the FHAB diet, making it affordable even for very poor households. It also increases income which further improves affordability.

### **Continuation of breastfeeding to two years should be promoted.**

Social behaviour change and communication interventions aimed at mothers and other influential family members are needed to increase optimal breastfeeding practices for children under two years of age. Given the significant nutritional contribution of breastmilk to a child aged 12–23 months in terms of energy, protein and vitamins and minerals, continuation of breastfeeding to two years, with appropriate complementary feeding, should be promoted. It is noted that suboptimal breastfeeding practices are prevalent in the district. The contribution of breastmilk in terms of calories as well as vitamins and minerals is significant even in the second year of the child's life. Moreover, the promotion of optimal breastfeeding practices will lower the cost of feeding of the child and will make it more affordable, and will also act as a natural family planning method thereby promoting child spacing.

### **Family planning services should be promoted to improve quality, composition and affordability of nutritious diets.**

The average family size in Pakistan is around seven. Disaggregation by wealth group indicates those in the fourth and fifth quintiles have a family size of 5–6, while very poor, poor and middle households have a family size of 7–8. This puts pressure on the limited resources of the latter wealth groups, thereby aggravating poverty. The CoD analysis clearly indicates that with the current level of income, even very poor households can afford nutritious diets if the family size is limited to five. Therefore, meeting the significant unmet need for family planning and limiting family size through social behavioural change communication strategies has nutritional implications in terms of reducing the cost and improving the quality and composition of foods consumed by the household.

### **Social protection schemes should be scaled up to improve affordability of nutritious diets.**

The affordability gap for the FHAB diet is 11 per cent and 3 per cent of income for very poor and poor households respectively. Scaling up of carefully designed safety net interventions through cash transfer or cash for work programmes for the very poor will allow households to purchase a variety of foods from the local market, enabling them to achieve a nutritious diet.

### **Nutrition-sensitive agricultural interventions should be implemented to improve access to nutritious diets at household level.**

Rural communities are mostly farmers and consume whatever they produce in many communities around the world including in Pakistan. Encouraging households to produce diversified foods in kitchen gardens, community gardens and small pieces of farmland will improve access to nutritious diets. This includes growing vegetables, fruit trees, and keeping chickens and small ruminants.





# Annexes

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**Annex 1.1. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Charsadda Livestock/Poultry Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>						Min	Max
(Bread, white)	14.59	14.59	14.59	14.59	14.59	0	7
(Millet, pearl, flour, local)	8.75	8.75	8.75	8.75	8.75	0	0
(Millet, pearl, local)	6.3	6.33	6.3	6.3	6.31	0	0
(Sorghum, grain or flour, local)	2.9	2.8	2.8	2.9	2.85	0	0
(Vermicelli)	11.43	11.43	11.43	11.43	11.43	0	7
(Wheat, flour, maida)	5.1	5.1	5.1	5.1	5.1	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	5.91	5.81	5.79	5.85	5.84	0	7
Ata, Sada, Packet (Wheat, flour, white)	5.69	5.68	5.71	5.71	5.7	0	14
Jowar (Sorghum, raw)	8.95	8.95	8.95	8.95	8.95	0	0
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	13.18	12.66	12.68	13.05	12.89	0	7
Rice (Motta Brown Chawal) (Rice, brown, par-boiled, home pounded, raw)	5.98	5.8	5.84	5.91	5.88	0	7
Rice (Toota Chawal) (Rice, grain or flour)	9.45	9.21	9.29	9.42	9.34	0	7
Sooji, gom (Semolina, wheat, raw)	6.01	6.01	6.01	6.01	6.01	0	7
Wheat flour white (Wheat, flour, white, refined)	6.14	5.95	5.95	6.08	6.03	0	14
Wheat, flour, brown, whole (Wheat, whole, raw)	3.67	3.67	3.67	3.67	3.67	0	7
Wheat, local or hyv (Wheat, hyv)	3.93	3.84	3.86	3.91	3.89	0	0
<b>Roots and tubers</b>							
(Horseradish)	1.41	1.29	1.29	2.06	1.59	0	7
(Potato)	5.58	5.21	5.19	5.52	5.38	0	14
(Sago palm, starch)	2.5	2.5	2.5	2.5	2.5	0	7
Bon Alu, bivinno projati (Yam, raw)	4.23	4.13	4.04	4.13	4.13	0	7
Dudh kochu (Colocasia, taro or tannia, raw)	1.75	1.83	1.83	1.96	1.84	0	7
Misti alu, holdey (Sweet potato, pale yellow flesh, raw)	3.5	3.5	3.5	3.5	3.5	0	0
Shalgom (Turnip, raw)	2.83	4.25	4.03	3.25	3.53	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	12.61	12.57	12.61	12.61	12.6	0	7
(Bean, mung)	15.89	15.89	15.89	15.89	15.89	0	7
(Cowpea)	16.98	16.87	16.91	17.02	16.95	0	7
Akhrot (Walnuts)	23.33	23.33	23.33	23.33	23.33	0	7
Arhar dal (Red gram, split, dried, raw)	41.97	41.97	41.97	41.97	41.97	0	7
Chilgoza (Chilgoza pine, dried)	280	280	280	280	280.0	0	7
China badam (Peanut, raw)	19.82	19.78	19.78	19.91	19.82	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	23.18	23.18	23.18	23.18	23.18	0	7
Gari kalai/Soyabean (Soybean, dried, raw)	12	12	12	12	12.0	0	0



Hizlee badam (Cashew nut, raw)	165	165	165	165	165.0	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	19	19	19	19	19.0	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	42	42	42	42	42.0	0	7
Pesta (Pistachio nuts, dried)	125.8	125.8	125.8	125.8	125.8	0	0
Til (Sesame, seeds, whole, dried)	51.43	51.43	51.43	51.43	51.43	0	0
<b>Meat and offal</b>							
(Beef)	30	30	30	30	30.0	0	7
(Goat)	60	59	60	60	59.75	0	7
(Poultry)	19.17	15.25	15.75	17.34	16.88	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	40	40	40	40	40.0	0	7
<b>Fish, seafood, amphibians and invertebrates</b>							
Any Type (Fish)	26.13	25.75	25.75	25.75	25.84	0	7
Fish, Mahseer (Fish, carp, raw)	28	25.86	24.86	24.43	25.79	0	0
Rui, nodir (Fish, rohu, river, raw)	26.25	23.88	23.5	23.88	24.38	0	0
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	36.03	32.44	32.48	35.04	34.0	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	26.53	26.7	27.95	28.96	27.53	0	14
<b>Milk and milk products</b>							
(Milk, curds)	8.71	8.65	8.65	8.71	8.68	0	14
(Milk, buffalo)	15.15	15.15	15.17	15.15	15.15	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	7.88	7.96	7.96	7.83	7.9	0	7
Poneer (Cheese, cottage)	30.55	33.33	33.33	30.55	31.48	0	0
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)	12	9.67	9.78	11.67	10.78	0	7
(Eggplant)	5.65	3.73	3.88	4.12	4.35	0	7
(Gourd, bottle)	8.43	8	7.93	7.38	7.91	0	7
(Gourd, ridge)	7	4	3	7	5.83	0	7
(Leaf, fenugreek)	5.29	5.33	5.33	5.29	5.31	0	7
(Mango, green)	4	4	4	4	4.0	0	7
(Onion, with stalks)	4.5	4.5	4.5	4.51	4.5	0	14
(Onion)	5.24	4.35	4.35	5.07	4.75	0	7
(Pumpkin)	3.72	8.15	8.15	10.15	7.54	0	7
Badhakopi (Cabbage, raw)	5.05	3.75	4.75	5.1	4.75	0	7
Dheros (Okra, raw)	15.17	8.58	9.42	12.58	11.44	0	7
Gajor (Carrot, raw)	3.14	3.32	3.38	3.83	3.44	0	7
Palong shak (Spinach, raw)	3.89	4.49	4.49	4.06	4.16	0	7
Shosa (Cucumber, peeled, raw)	4.91	3.62	3.44	4.23	4.11	0	7
<b>Fruit and fruit products</b>							
(Apple)	13.04	13.1	13.12	12.96	13.05	0	7
(Banana, ripe)	25.95	19.86	20.29	22.94	22.26	0	7
(Coconut, dried)	66.67	66.67	66.67	66.67	66.67	0	7
(Tomato, green)	2.92	2.8	3	4.03	3.19	0	7
(Tomato, ripe)	5.17	4.63	5.13	6.58	5.38	7	14
Dumur, paka (Fig, ripe)	54	48	48	54	51.0	0	7

Khejur, paka, taza (Dates)	19	17.8	17.9	18.6	18.32	0	7
Khorma (Dates, dried)	11.38	10.97	10.97	11.44	11.19	0	7
Komola (Orange)	49.49	49.26	59.65	57.99	53.98	0	7
Nashpati (Pear, asian)	15	15	15	15	15.0	0	7
Peyara, bivinno variety, kancha (Guava, green)	7.11	4.61	4.66	5.61	5.49	0	7
<b>Oils and fats</b>							
(Oil, castor)	13	13	13	13	13.0	0	0
(Oil, soybean)	14.75	15	15	14.5	14.81	0	0
Dalda/Bonoshpati (Ghee, vegetable)	17.18	16.97	17.05	17.14	17.09	7	14
Ghee, gorur (Ghee, cow)	13.11	12.82	12.78	13	12.93	0	7
Sorishar tel (Oil, mustard)	27.3	27.02	27.02	27.21	27.14	0	7
<b>Sugars and confectionary</b>							
(Biscuits, salty)	19.24	19.12	19.12	19.24	19.18	0	7
(Sugar, brown)	5.35	5.75	5.5	5.35	5.49	0	14
(Sweets)	47.13	46.5	46.62	46.62	46.72	0	7
Akher Ross (Sugar cane, juice)	4	4	4	4	4.0	0	7
Chini, sada (Sugar, white)	8.17	8.19	8.1	8.21	8.17	0	14
Cookes (Packet/Brand) (Cookies)	26.25	26.25	26.25	26.25	26.25	0	7
Cookies (Bakery) (Cookies (Bakery))	16.62	16.47	16.42	16.62	16.53	0	7
Gur, Akh (Jaggery, sugarcane, solid)	12.32	14.16	14.16	12.32	13.24	0	14
Modhu (Honey)	77.8	77.29	77.29	77.43	77.46	0	7
<b>Herbs, spices and condiments</b>							
Ada (Ginger root, raw)	42.17	40.08	40.08	42.17	41.13	0	14
Baking powder (Baking powder)	10.81	10.81	10.81	10.81	10.81	0	7
Darchini gura (Cinnamon, ground)	61.64	61.64	61.64	61.64	61.64	0	7
Dhone pata (Coriander leaf, raw)	42.74	42.74	42.74	42.74	42.74	0	14
Elach (Cardamom, seeds)	152.22	152.22	152.22	152.22	152.22	0	14
Golmorich (Pepper, black)	138.62	138.62	138.62	138.62	138.62	0	14
Holud (Turmeric, dried)	55.13	55.13	55.13	55.13	55.13	7	14
Jira (Cumin, seeds)	94.96	94.96	94.96	94.96	94.96	0	7
Kancha morich (Chilli, green, with seeds, raw)	13	10	10.5	11.5	11.25	0	14
Labongo (Cloves, dried)	200	200	200	200	200.0	0	7
Lebu, Kagoji (Lemon, kagoji)	14	18	16	15	15.75	0	14
Lemon ghas (Lemongrass, raw)	69.29	69.29	69.29	69.29	69.29	0	14
Lobon (Salt)	1.57	1.57	1.57	1.57	1.57	7	14
Mauri (Fennel, seeds)	121.93	121.93	121.93	121.93	121.93	0	7
Pudina pata (Spearmint leaf, raw)	18.4	18.4	18.4	18.4	18.4	0	14
Rosun (Garlic, raw)	42.67	42.67	42.67	42.67	42.67	0	14
Sarisha (Mustard, seeds)	30	30	30	30	30.0	0	0
Shukna morich (Chilli, red, dry)	38.74	38.15	38.15	38.15	38.3	7	14
Tejpata (Bay leaf, dried)	22.5	22.5	22.5	22.5	22.5	0	7
<b>Beverages</b>							
Cha pata (Tea, powder)	61.37	58.9	58.9	58.9	59.52	7	14
Coffee, dudh o chini soho (Coffee, infusion, with sugar and milk powder, whole fat)	10	10	10	10	10.0	0	0

Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	25.43	24.77	24.1	24.1	24.6	0	14
Green Tea (Herb, tea, shih)	134.37	132.58	134.37	127.3	132.15	0	14
Komol paniyo (Beverage, carbonated)	5.82	5.79	5.81	5.79	5.8	0	7
Lassi (Beverage, fruit flavoured)	6.94	6.94	6.94	6.94	6.94	0	7
Composite dishes							
Khichuri (Khichuri, plain)	17.5	17.5	17.5	17.5	17.5	0	7

**Annex 1.2. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Tank Agriculture Livelihood Zone**

Food Types	Average Price Per 100g					Food frequency constraints	
	Winter	Spring	Summer	Autumn	Annual Average		
Grains and grain-based products						Min	Max
(Bread, white)	11.01	11.01	11.01	11.01	11.01	0	7
(Maize, grain or flour, local)	4.53	4.38	4.87	4.48	4.56	0	0
(Millet, pearl, flour, local)	4.26	4.58	4.32	4.17	4.33	0	0
(Millet, pearl, local)	4.27	4.25	4.27	4.27	4.27	0	0
(Rice, flaked)	17.22	16.89	16.56	17	16.92	0	0
(Sorghum, grain or flour, local)	3.76	3.74	3.73	3.76	3.75	0	0
(Vermicelli)	8.87	8.87	8.87	8.87	8.87	0	7
(Wheat, flour, maida)	6.27	6.2	6.41	6.67	6.39	0	0
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.88	3.87	3.82	3.85	3.86	0	7
Ata, Sada, Packet (Wheat, flour, white)	3.68	3.68	3.63	3.67	3.67	0	7
Bhutta, shukna (Maize, yellow, dried, raw)	4.28	4.24	4.22	4.21	4.24	0	7
Jowar (Sorghum, raw)	3.56	3.58	3.56	3.56	3.57	0	0
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	12.42	12.38	12	12.21	12.25	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	7.73	7.77	7.63	7.79	7.73	0	7
Rice (Toota Chawal) (Rice, grain or flour)	4.58	4.58	4.63	4.45	4.56	0	7
Sooji, gom (Semolina, wheat, raw)	6.13	6.27	6.13	6.17	6.17	0	7
Wheat flour white (Wheat, flour, white, refined)	4.03	3.98	4.01	4.03	4.01	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	4.13	4.13	4.13	4.13	4.13	0	0
Wheat, local or hyv (Wheat, hyv)	3.33	3.34	3.24	3.34	3.31	0	7

Roots and tubers							
(Horseradish)	4.03	4.18	4.29	4.3	4.19	0	14
(Potato)	4.08	4.29	4.5	4.33	4.3	0	14
(Sago palm, starch)	8	8	8	8	8.0	0	0
Bon Alu, bivinno projati (Yam, raw)		3	2.83	3.83	3.31	0	0
Dudh kochu (Colocasia, taro or tannia, raw)		4	3.27	3.9	3.59	0	0
Shalgom (Turnip, raw)	3.06	3.27	7.2	4.02	3.69	0	7
Legumes, nuts and seeds							
(Bean, kidney)	12.67	12.67	12.34	12.88	12.64	0	7
(Bean, mung)	11.44	11.44	11.27	11.5	11.41	0	7
Akhrot (Walnuts)	34	34	34	34	34.0	0	7
Arhar dal (Red gram, split, dried, raw)	149.21	149.21	149.21	149.21	149.21	0	0
China badam (Peanut, raw)	17.6	17.6	17.29	17.68	17.54	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	16.45	16.45	16.45	16.45	16.45	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	6.21	6.33	6.67	6.57	6.42	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	12.09	12.11	11.79	12.03	12.01	0	0
Meat and offal							
(Beef)	32.69	32.44	32.06	32.44	32.41	0	7
(Poultry)	28.3	28.44	31.85	32	30.15	0	14
Fish, seafood, amphibians and invertebrates							
Any Type (Fish)	15	15		15	15.0	0	7
Fish, Mahseer (Fish, carp, raw)	20	21		20	20.33	0	0
Rui, nodir (Fish, rohu, river, raw)	18.8	18.8	18	18.5	18.67	0	0
Tuna, kata chara (Fish, tuna, boneless, raw)	22.5	22.5	20	20	21.67	0	0
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	28.87	27.44	21.38	26.4	26.02	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	22	22.36	19.67	22.64	21.67	0	7
Milk and milk products							
(Milk, curds)	12.61	12.52	12.52	12.43	12.52	0	7
(Milk, buffalo)	9.29	8.97	9.29	9.29	9.21	0	7
Chagoler dudh (Milk, goat)	7	7	7	7	7.0	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	8.92	8.92	8.96	8.92	8.93	0	7
Vegetables and vegetable products							
(Gourd, bitter)			3.27	4.82	4.01	0	7
(Eggplant)	3.4	3.64	2.83	3.7	3.36	0	7
(Gourd, bottle)	2	2	2.36	3.29	2.78	0	7

(Gourd, ridge)			2.9	3.67	3.28	0	7
(Mango, green)			4.13		4.13	0	7
(Onion, with stalks)	5	5	3.25	5	3.64	0	14
(Onion)	4.17	4.33	4.75	4.88	4.53	0	7
(Pumpkin)	3.91	3.91	3.46	3.98	3.79	0	7
Badhakopi (Cabbage, raw)	2.74	2.91	4.28	4.88	3.59	0	7
Dheros (Okra, raw)			4.1	6	5.03	0	7
Gajor (Carrot, raw)	2.39	3	2.15	4.65	3.28	0	7
Palong shak (Spinach, raw)	3.29	3.29	3.49	3.79	3.47	0	7
Shosa (Cucumber, peeled, raw)	4.77	4.69	4.48	5.57	4.88	0	7
Fruit and fruit products							
(Apple)	13.8	13.87	11.94	14.91	13.63	0	7
(Banana, ripe)	10.64	10.4	8.78	10.68	10.12	0	7
(Coconut, dried)	88.93	88.93	88.8	88.93	88.9	0	7
(Grapes, pale green)			9.04	11.39	10.19	0	7
(Mango, ripe)			10.08	11.7	10.87	0	7
(Melon, musk, other fruits)			2.61	4.5	3.56	0	14
(Plums)			8.72	10.35	9.51	0	0
(Tomato, ripe)	5.27	5.27	11.81	5.9	7.06	0	14
Dumur, paka (Fig, ripe)			15.75	16.38	16.06	0	0
Khejur, paka, taza (Dates)	15.33	15.33	6.09	7.95	7.98	0	7
Khorma (Dates, dried)	14.61	14.61	19.15	21.14	17.45	0	7
Komola (Orange)	5.91	6.21	8.11	6.67	6.42	0	7
Nashpati (Pear, asian)			9	11	10.04	0	0
Peyara, bivinno variety, kancha (Guava, green)	14.44	14.44	9.01	15.1	13.25	0	7
Tarmuz, lal, paka (Watermelon, ripe)	7	7	2.52	4.93	3.81	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	21.89	21.89	69.64	74.78	47.05	0	0
Oils and fats							
(Oil, castor)	98.52	98.52	98.52	98.52	98.52	0	0
Dalda/Bonoshpati (Ghee, vegetable)	19.65	19.59	19.56	19.62	19.6	0	7
Ghee, gorur (Ghee, cow)	16.31	16.23	16.29	16.29	16.28	0	14
Makhon, nonta (Butter, salted)	70	70	70	70	70.0	0	7
Sorishar tel (Oil, mustard)	30.07	30.07	29.9	28.07	29.53	0	0
Tiler tel (Oil, sesame)	62.54	62.54	62.54	62.54	62.54	0	0
Sugars and confectionary							
(Biscuits, salty)	39.1	39.1	39.1	39.1	39.1	0	7
(Sugarcane)	2	2	2	2	2.0	0	7
(Sweets)	14.29	14.29	14.12	14.27	14.24	0	7
Chini, sada (Sugar, white)	5.81	5.81	5.71	5.83	5.79	7	14
Cookes (Packet/Brand) (Cookies)	24.44	24.44	24.44	24.44	24.44	0	7
Cookies (Bakery) (Cookies (Bakery))	17.76	17.34	17.34	18.04	17.62	0	7
Gur, Akh (Jaggery, sugarcane, solid)	12.3	12.1	12.35	12.2	12.24	0	7

Modhu (Honey)	130	130	133.33	130	130.83	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	81.35	81.3	81.3	81.35	81.33	0	7
Baking powder (Baking powder)	80.76	80.76	80.69	80.76	80.74	0	0
Darchini gura (Cinnamon, ground)	152.94	152.94	152.94	152.94	152.94	0	7
Dhone pata (Coriander leaf, raw)	63.73	63.73	63.73	63.73	63.73	0	14
Elach (Cardamom, seeds)	162.08	162.08	162.08	162.08	162.08	0	7
Golmorich (Pepper, black)	156.53	156.53	156.53	156.53	156.53	0	7
Holud (Turmeric, dried)	97.37	97.37	97.37	97.37	97.37	0	7
Jira (Cumin, seeds)	139.28	139.28	139.28	139.28	139.28	0	7
Kancha morich (Chilli, green, with seeds, raw)	12.82	12.82	12.84	12.86	12.83	0	14
Labongo (Cloves, dried)	145.56	145.56	145.56	145.56	145.56	0	7
Lebu, Kagoji (Lemon, kagoji)	11.5	11.5	17.43	15.92	15.99	0	14
Lemon ghas (Lemongrass, raw)	80.61	80.61	80.61	80.61	80.61	0	7
Lobon (Salt)	1.4	1.4	1.4	1.4	1.4	7	14
Mauri (Fennel, seeds)	98.33	98.33	98.33	98.33	98.33	0	7
Pudina pata (Spearment leaf, raw)	66.22	66.22	64.96	66.22	65.9	0	7
Rosun (Garlic, raw)	15.54	15.54	15.06	15.3	15.36	0	14
Shukna morich (Chilli, red, dry)	77.32	77.32	77.32	77.32	77.32	7	14
Tejpata (Bay leaf, dried)	100	100	100	100	100.0	0	7
Beverages							
Cha pata (Tea, powder)	65.28	65.28	65.28	65.28	65.28	0	14
Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	10.44	10.44	10.44	10.44	10.44	0	7
Green Tea (Herb, tea, shih)	80.14	80.14	80.14	80.14	80.14	0	14
Komol paniyo (Beverage, carbonated)	11.44	11.44	11.44	11.44	11.44	0	7
Composite dishes							
Dheros-tomato bhuna (Okra and tomato bhuna)			16		16.0	0	7

**Annex 1.3. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Tank Livestock/Poultry Livelihood Zone**

Food Types	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	10.2	10.2	10.2	10.2	10.2	0	7
(Maize, grain or flour, local)	5.43	5.34	5.8	5.42	5.5	0	0
(Millet, pearl, flour, local)	4	4	4	4	4.0	0	7
(Millet, pearl, local)	4.73	4.73	4.73	4.73	4.73	0	0
(Rice, flaked)	15.67	15.63	15.67	15.67	15.66	0	0
(Sorghum, grain or flour, local)	4.03	4.06	4.03	4.03	4.04	0	0
(Vermicelli)	8.43	8.43	8.43	8.43	8.43	0	7
(Wheat, flour, maida)	5.91	5.91	5.91	5.64	5.84	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.85	3.84	3.77	3.84	3.82	0	7
Ata, Sada, Packet (Wheat, flour, white)	3.66	3.67	3.63	3.66	3.66	0	7
Bhutta, shukna (Maize, yellow, dried, raw)	6.15	6.15	6.15	6.15	6.15	0	7
Jowar (Sorghum, raw)	3.96	3.97	3.96	3.96	3.96	0	0
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	12.75	12.75	12.69	12.75	12.73	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	7.48	7.45	7.63	7.48	7.51	0	7
Rice (Toota Chawal) (Rice, grain or flour)	4.7	4.72	4.7	4.7	4.7	0	7
Sooji, gom (Semolina, wheat, raw)	6.2	6.9	8.38	6.37	6.96	0	7
Wheat flour white (Wheat, flour, white, refined)	4.22	4.22	4.21	4	4.16	0	7
Wheat, local or hyv (Wheat, hyv)	3.41	3.38	3.36	3.41	3.39	0	7
<b>Roots and tubers</b>							
(Horseradish)	4.94	5.49	6	6.59	5.68	0	14
(Potato)	3.59	3.85	4.19	4.22	3.96	0	14
Bon Alu, bivinno projati (Yam, raw)		2	3.11	4.47	3.74	0	0
Dudh kochu (Colocasia, taro or tannia, raw)		2.5	3.72	4.33	3.99	0	0
Shalgom (Turnip, raw)	2.98	3.88	4	5.52	4.1	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	12.22	12.22	12.22	12.22	12.22	0	7
(Bean, mung)	10.58	10.75	10.74	11.04	10.78	0	7
(Cowpea)	16	16	16	16	16.0	0	0
Akhrot (Walnuts)	48.34	48.34	48.34	48.34	48.34	0	0
Arhar dal (Red gram, split, dried, raw)	152.22	152.22	152.22	152.22	152.22	0	0
Chilgoza (Chilgoza pine, dried)	300	300	300	300	300.0	0	0
China badam (Peanut, raw)	18.56	18.48	18.03	18.56	18.41	0	7
Chola, shukna (Bengal gram, whole, dried, raw)	15.06	15.06	14.93	15.21	15.07	0	7



Gari kalai/Soyabean (Soybean, dried, raw)	10	10	10	10	10.0	0	7
Hizlee badam (Cashew nut, raw)	139.52	139.52	139.52	139.52	139.52	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	6.04	6.04	6.56	6.29	6.21	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	11.52	11.52	11.58	11.52	11.54	0	0
Pesta (Pistachio nuts, dried)	166.67	166.67	166.67	166.67	166.67	0	0
Til (Sesame, seeds, whole, dried)	37.5	37.5	37.5	37.5	37.5	0	0
<b>Meat and offal</b>							
(Beef)	31.68	31.68	31.16	31.42	31.49	0	7
(Poultry)	28.91	29	28.19	28.83	28.73	0	7
<b>Fish, seafood, amphibians and invertebrates</b>							
Fish, Mahseer (Fish, carp, raw)	20	20		20	20.0	0	0
Rui, nodir (Fish, rohu, river, raw)	41.14	41.43		19.43	34.0	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	27.6	27.37	20.27	26.08	25.33	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	18.73	18.79	16.86	20.11	18.62	0	7
<b>Milk and milk products</b>							
(Milk, curds)	8.05	8.05	8.36	7.95	8.1	0	7
(Milk, buffalo)	8.6	8.6	8.6	8.6	8.6	0	7
Chagoler dudh (Milk, goat)	6.8	6.8	6.8	6.8	6.8	0	14
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	12.95	12.95	13.01	13.52	13.11	0	7
Poneer (Cheese, cottage)	24	24	24	24	24.0	0	0
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)			3.4	5.04	4.22	0	7
(Eggplant)	3.5	3.5	3.02	4.08	3.54	0	7
(Gourd, bottle)	3.17	3.17	2.67	3.75	3.2	0	7
(Gourd, ridge)			3.25	3.81	3.53	0	7
(Leaf, fenugreek)	3	3	5.5	6	4.14	0	7
(Mango, green)			3.63		3.63	0	0
(Onion, with stalks)			3.74	6	3.85	0	14
(Onion)	4.83	5.52	8.21	8.28	6.71	0	7
(Pumpkin)	3.86	4.21	3.16	3.85	3.64	0	7
Badhakopi (Cabbage, raw)	2.77	3.03	4.12	5.07	3.85	0	7
Dheros (Okra, raw)			3.68	5.67	4.72	0	7
Gajor (Carrot, raw)	2.36	2.63	2.5	5.02	3.22	0	7
Palong shak (Spinach, raw)	2.79	2.83	3	3.6	3.06	0	7
Shosa (Cucumber, peeled, raw)	4.69	4.91	5.22	8.26	5.77	0	7
<b>Fruit and fruit products</b>							
(Apple)	13.54	12.98	10.92	13.14	12.63	0	7
(Banana, ripe)	9.52	9.18	8.03	9.26	9.0	0	7
(Coconut, dried)	73.63	73.63	82.38	82.25	77.97	0	7
(Grapes, pale green)			10.63	12.25	11.44	0	7

(Mango, ripe)			10.88	12.5	11.69	0	7
(Melon, musk, other fruits)			3.81	5.25	4.53	0	7
(Plums)	6		10.39	11.4	10.79	0	7
(Tomato, ripe)	4.67	4.67	12	5.26	6.65	0	14
Dumur, paka (Fig, ripe)	40	40	26.5	27	31.0	0	0
Khejur, paka, taza (Dates)			6.61	8.96	7.81	0	7
Khorma (Dates, dried)	14.81	25.92	24.55	25.69	22.78	0	7
Komola (Orange)	5.31	5.42	6.75	8.03	6.28	0	7
Nashpati (Pear, asian)			9.8	11.92	10.95	0	0
Peyara, bivinno variety, kancha (Guava, green)	14.94	14.94	15.41	19.98	16.32	0	7
Tarmuz, lal, paka (Watermelon, ripe)			3.23	4.36	3.8	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	16.78	16.78	77.56	78	47.28	0	0
Oils and fats							
(Oil, castor)	111.6	111.6	111.6	111.6	111.6	0	0
(Oil, soybean)	50.2	50.2	50.2	50.2	50.2	0	0
Dalda/Bonoshpati (Ghee, vegetable)	18.4	18.4	18.18	18.38	18.34	0	7
Ghee, gorur (Ghee, cow)	14.93	15.35	15.12	15.37	15.19	0	14
Makhon, nonta (Butter, salted)	95	95	95	95	95.0	0	7
Margarine (Margarine)	100	100	100	100	100.0	0	0
Sorishar tel (Oil, mustard)	23.2	23.2	23.24	23.2	23.21	0	0
Tiler tel (Oil, sesame)	50.76	50.76	50.76	50.76	50.76	0	0
Sugars and confectionary							
(Biscuits, salty)	39.02	39.02	39.02	39.02	39.02	0	7
(Sugarcane)	3.5	3.5	3.5	3.5	3.5	0	7
(Sweets)	16.88	16.88	16.55	16.88	16.79	0	7
Akher Ross (Sugar cane, juice)	4	4	4	4	4.0	0	7
Chini, sada (Sugar, white)	6.01	5.99	5.95	6.05	6.0	7	14
Cookes (Packet/Brand) (Cookies)	25.76	25.76	25.76	25.76	25.76	0	7
Cookies (Bakery) (Cookies (Bakery))	16.17	16.17	16.23	16.03	16.15	0	7
Gur, Akh (Jaggery, sugarcane, solid)	7.21	7.21	7.23	7.21	7.21	0	7
Modhu (Honey)	122.5	122.5	122.5	122.5	122.5	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	76.56	76.56	76.56	76.56	76.56	0	7
Baking powder (Baking powder)	59.13	59.13	59.13	59.13	59.13	0	0
Darchini gura (Cinnamon, ground)	150	150	150	150	150.0	0	7
Dhone pata (Coriander leaf, raw)	62.62	62.62	62.62	62.62	62.62	0	14
Elach (Cardamom, seeds)	164.17	164.17	164.17	164.17	164.17	0	7
Golmorich (Pepper, black)	149.31	149.31	149.31	149.31	149.31	0	7
Holud (Turmeric, dried)	98.48	98.48	98.48	98.48	98.48	0	7
Jira (Cumin, seeds)	133.33	133.33	133.33	133.33	133.33	0	7
Kancha morich (Chilli, green, with seeds, raw)	15.84	15.84	15.55	15.84	15.77	0	14
Labongo (Cloves, dried)	170	170	170	170	170.0	0	7

Lebu, Kagoji (Lemon, kagoji)		15	21.78	21.09	21.3	0	14
Lemon ghas (Lemongrass, raw)	83.62	83.62	174.93	83.62	106.45	0	7
Lobon (Salt)	1.44	1.5	1.44	1.44	1.45	7	14
Mauri (Fennel, seeds)	95.83	95.83	95.83	95.83	95.83	0	7
Pudina pata (Spearmint leaf, raw)	56.97	56.97	56.97	56.97	56.97	0	7
Rosun (Garlic, raw)	15.75	15.75	16.29	15.78	15.89	0	7
Shukna morich (Chilli, red, dry)	74.69	74.69	74.69	74.69	74.69	7	14
Tejpata (Bay leaf, dried)	100	100	100	100	100.0	0	0
<b>Beverages</b>							
Cha pata (Tea, powder)	74.76	74.76	74.76	74.76	74.76	7	14
Green Tea (Herb, tea, shih)	78.47	78.47	78.47	78.47	78.47	0	14
Komol paniyo (Beverage, carbonated)	9.4	9.4	9.4	9.4	9.4	0	7

**Annex 1.4. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Islamabad Paid/Unpaid Livelihood Zone**

Food Types	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>						Min	Max
(Bread, white)	8.73	8.73	8.73	8.73	8.73	0	7
(Maize, grain or flour, local)	4.09	4.09	4.09	4.09	4.09	0	7
(Vermicelli)	10.54	10.54	10.54	10.54	10.54	0	7
(Wheat, flour, maida)	5	5	5	5	5.0	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.99	3.99	3.99	3.99	3.99	0	0
Ata, Sada, Packet (Wheat, flour, white)	4.19	4.19	4.19	4.19	4.19	0	14
Bhutta, shukna (Maize, yellow, dried, raw)	3.71	3.71	3.71	3.71	3.71	0	14
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	14.77	14.77	14.77	14.77	14.77	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6.45	6.45	6.45	6.45	6.45	0	0
Rice (Toota Chawal) (Rice, grain or flour)	8.13	8.13	8.13	8.13	8.13	0	7
Sooji, gom (Semolina, wheat, raw)	6.08	6.08	6.08	6.08	6.08	0	7
Wheat flour white (Wheat, flour, white, refined)	6	6	6	6	6.0	0	7
Wheat, local or hyv (Wheat, hyv)	5	5	5	5	5.0	0	0
<b>Roots and tubers</b>							
(Horseradish)	4	4	4	4	4.0	0	7
(Potato)	4.4	4.98	3.96	5.63	4.74	0	14
Shalgom (Turnip, raw)	4			6.33	4.47	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	16.38	16.67	16.67	16.67	16.59	0	14
(Bean, mung)	12.46	12.96	12.96	12.96	12.83	0	7
(Cowpea)	12	12	12	12	12.0	0	7

Akhrot (Walnuts)	25				25.0	0	7
Arhar dal (Red gram, split, dried, raw)	20				20.0	0	7
China badam (Peanut, raw)	28	27.38	27.38	32.53	28.93	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	7.5				7.5	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	10	10	10	10	10.0	0	7
Meat and offal							
(Beef)	27.5	42.5	42.5	42.5	38.75	0	7
(Goat)	60	120	120	120	105.0	0	7
(Poultry)	20.34	17.98	15.05	21.07	18.61	0	14
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	28.04	22.65	22.65	22.65	24.0	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	20.35	16.96	15.33	18.07	17.68	0	7
Milk and milk products							
(Milk, buffalo)	9.87	9.87	9.87	9.87	9.87	0	7
Vegetables and vegetable products							
(Gourd, bitter)			8.42		8.42	0	7
(Eggplant)			6.55	6	6.52	0	7
(Gourd, snake)			5		5.0	0	14
(Leaf, fenugreek)	7.23	5.74	5.74	5.74	6.49	0	14
(Onion)	7.78	9.3	7.02	11.43	8.89	0	14
(Pumpkin)			10		10.0	0	7
Badhakopi (Cabbage, raw)	4.78	4	4	4	4.33	0	7
Dheros (Okra, raw)			8.15		8.15	0	7
Gajor (Carrot, raw)	5.93	6	6	5.83	5.93	0	7
Palong shak (Spinach, raw)	3.16	3.09	3.09	3.09	3.12	0	7
Shosa (Cucumber, peeled, raw)	6.4	7	6	6.33	6.4	0	14
Fruit and fruit products							
(Apple)	13.95	14	14.05	14.05	14.01	0	14
(Banana, ripe)	12.08	11.71	11.64	11.71	11.79	0	14
(Grapes, pale green)			18.33		18.33	0	7
(Mango, ripe)			15.22		15.22	0	7
(Melon, musk, other fruits)			8.29		8.29	0	7
(Plums)			77.33		77.33	0	7
(Tomato, green)	7			6	6.5	0	7
(Tomato, ripe)	11.13	12.95	8.73	16.3	12.31	0	14
Khejur, paka, taza (Dates)	18	18	17	18	17.6	0	7
Khorma (Dates, dried)						0	7
Komola (Orange)	13.48	22.41	22.41	22.41	14.87	0	14
Peyara, bivinno variety, kancha (Guava, green)	12.8	16	16	16	14.0	0	7
Tarmuz, lal, paka (Watermelon, ripe)			3.83		3.83	0	7

Oils and fats							
Dalda/Bonoshpati (Ghee, vegetable)	18.8	18.8	18.8	18.8	18.8	0	7
Ghee, gorur (Ghee, cow)	12.58	12.58	12.58	12.58	12.58	0	14
Makhon, nonta (Butter, salted)	80	80	80	80	80.0	0	7
Sorishar tel (Oil, mustard)	33.64	33.55	33.55	33.55	33.57	0	0
Sugars and confectionary							
(Biscuits, salty)	24.77	24.77	24.77	24.77	24.77	0	7
(Sweets)	25.33	25.33	25.33	25.33	25.33	0	7
Chini, sada (Sugar, white)	6.64	6.64	6.59	6.54	6.6	7	14
Cookes (Packet/Brand) (Cookies)	23.74	23.74	23.74	23.74	23.74	0	14
Cookies (Bakery) (Cookies (Bakery))	25.54	25.54	25.54	25.54	25.54	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	45.54	45.54	45.54	45.54	45.54	0	7
Darchini gura (Cinnamon, ground)	184.72	184.72	184.72	184.72	184.72	0	14
Dhone pata (Coriander leaf, raw)	8.99	8.99	8.57	8.99	8.88	0	14
Elach (Cardamom, seeds)	225.71	225.71	225.71	225.71	225.71	0	14
Golmorich (Pepper, black)	235.71	235.71	235.71	235.71	235.71	0	14
Holud (Turmeric, dried)	36.78	36.78	36.78	36.78	36.78	7	14
Jira (Cumin, seeds)	146.67	146.67	146.67	146.67	146.67	0	14
Kancha morich (Chilli, green, with seeds, raw)	18.5	18.5	17	18	18.0	0	14
Labongo (Cloves, dried)	188	188	188	188	188.0	0	14
Lebu, Kagoji (Lemon, kagoji)	18.86	20	20	18.67	19.38	0	7
Lobon (Salt)	2.22	2.22	2.22	2.22	2.22	7	14
Mauri (Fennel, seeds)	45	45	45	45	45.0	0	7
Pudina pata (Spearment leaf, raw)	20.61	20.61	20.61	20.61	20.61	0	14
Rosun (Garlic, raw)	29.27	28.91	27.45	29.82	28.86	0	14
Sarisha (Mustard, seeds)	12	12	12	12	12.0	0	0
Shukna morich (Chilli, red, dry)	31.08	31.08	31.08	31.08	31.08	7	14
Tejpata (Bay leaf, dried)	24	24	24	24	24.0	0	7
Beverages							
Cha pata (Tea, powder)	70.08	70.08	70.08	70.08	70.08	7	14
Green Tea (Herb, tea, shih)	100	100	100	100	100.0	0	14
Komol paniyo (Beverage, carbonated)	6.75	6.75	11.37	6.75	9.39	0	7

**Annex I.5. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Faisalabad Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	15.4	15.23	15.23	15.24	15.28	0	7
(Maize, grain or flour, local)	3.65	3.4	3.4	3.65	3.53	0	7
(Millet, pearl, local)	3.12	3.02	3.04	3.12	3.07	0	0
(Rice, flaked)	12	11	11	11	11.25	0	0
(Vermicelli)	20.39	20.39	20.02	20.39	20.3	0	7
(Wheat, flour, maida)	4.63	4.44	4.63	4.7	4.6	0	0
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.82	3.59	3.59	3.78	3.7	0	7
Ata, Sada, Packet (Wheat, flour, white)	7.06	6.87	6.93	6.99	6.96	0	7
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	11.21	10.41	10.41	11.15	10.79	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)						0	0
Rice (Toota Chawal) (Rice, grain or flour)	6.6	6	6.02	6.44	6.27	0	7
Sooji, gom (Semolina, wheat, raw)	4.99	4.79	4.85	4.95	4.89	0	7
Wheat flour white (Wheat, flour, white, refined)	4.2	3.5	3.5	4.2	3.85	0	0
Wheat, flour, brown, whole (Wheat, whole, raw)	4.4	4.2	4.3	4.4	4.33	0	7
<b>Roots and tubers</b>							
(Horseradish)	2.03	3.02	3.11	2.43	2.65	0	14
(Potato)	3.11	4.44	4.49	3.75	3.95	0	14
(Sago palm, starch)	14.73	14.27	14.36	14.45	14.45	0	0
Shalgom (Turnip, raw)	2.58	3.66	3.76	3.48	3.37	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	12	11	11	12	11.5	0	0
(Bean, mung)	10.5	11.67	11.76	12.08	11.5	0	7
(Cowpea)	13	13	13	12	12.75	0	7
Akhrot (Walnuts)	156	153.6	155.2	156	155.2	0	7
Arhar dal (Red gram, split, dried, raw)	56.74	57.07	57.07	56.74	56.9	0	7
Chilgoza (Chilgoza pine, dried)	20	16	16	20	18.0	0	0
China badam (Peanut, raw)	21.92	21.3	21.56	21.77	21.64	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	10.02	11.47	11.7	9.89	10.77	0	7
Hizlee badam (Cashew nut, raw)	200	200	200	200	200.0	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	6	6.5	6.5	5.5	6.13	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	9.57	9.47	9.57	9.55	9.54	0	7

Pesta (Pistachio nuts, dried)	200	193.33	193.33	200	196.67	0	0
<b>Meat and offal</b>							
(Beef)	31.23	32.46	31.69	33.92	32.33	0	7
(Goat)	68.82	64.88	64.88	68.12	66.68	0	7
(Poultry)	24.46	20.55	20.5	22.25	21.94	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	31.23	32.46	31.69	33.92	32.33	0	7
<b>Fish, seafood, amphibians and invertebrates</b>							
Any Type (Fish)	25.43	23.67	22.4	23.67	23.92	0	7
Rui, nodir (Fish, rohu, river, raw)	25.75	25.13	24.86	24.71	25.13	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	26.75	26.75	22.7	26.75	25.74	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	20.95	16.94	16.8	19.31	18.5	0	14
<b>Milk and milk products</b>							
(Milk, curds)	9.03	9.1	9	8.93	9.01	0	14
(Milk, buffalo)	8.24	8.97	9.04	8.18	8.61	0	14
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	7.5	7.5	7.5	7.5	7.5	0	7
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)	12	12	12	12	12.0	0	7
(Eggplant)	5.16	5.58	5.16	5.08	5.25	0	7
(Leaf, fenugreek)	5.01	4.99	4.78	8.23	5.72	0	7
(Onion)	4.92	5.47	5.6	5.33	5.33	0	7
(Pumpkin)	4	5	4	5	4.5	0	7
Badhakopi (Cabbage, raw)	3.42	3.38	3.35	3.48	3.4	0	7
Dheros (Okra, raw)	12	16	16	12	14.0	0	7
Gajor (Carrot, raw)	2.77	3.69	3.38	3.31	3.27	0	7
Kacha pepe siddha, lobon chara (Papaya, unripe, cooked)	16	16	16	16	16.0	0	0
Palong shak (Spinach, raw)	1.57	1.75	1.7	1.65	1.67	0	7
Shosa (Cucumber, peeled, raw)	4.68	4.75	4.61	4.59	4.66	0	14
<b>Fruit and fruit products</b>							
(Apple)	14.5	14.33	14.84	14.37	14.51	0	7
(Banana, ripe)	9.73	9.92	10.08	9.72	9.86	0	7
(Mango, ripe)			9.33		9.33	0	14
(Melon, musk, other fruits)			15		15.0	0	14
(Plums)	65	65	65	65	65.0	0	7
(Tomato, ripe)	7.27	9.64	9.45	7.32	8.42	0	14
Dumur, paka (Fig, ripe)	130	120	130	130	127.5	0	7
Khejur, paka, taza (Dates)	32	28	28	32	30.0	0	14
Khorma (Dates, dried)	20.8	30.29	20.62	20.66	23.09	0	7
Komola (Orange)	12.48	18.28	18.41	20.94	17.09	0	14
Nashpati (Pear, asian)	30	20	20	30	26.67	0	7



Peyara, bivinno variety, kancha (Guava, green)	4.67	5.43	7.15	6.21	5.64	0	14
Tarmuz, lal, paka (Watermelon, ripe)			1.24		1.24	0	14
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	12	10.79	11	11.63	11.36	0	7
Zambura (Pomelo)	4.57	4.71	4.85	4.34	4.62	0	7
<b>Oils and fats</b>							
Dalda/Bonoshpati (Ghee, vegetable)	16.57	15.93	15.93	16.43	16.21	0	7
Ghee, gorur (Ghee, cow)	14.78	14.4	14.4	14.71	14.57	0	14
Sorishar tel (Oil, mustard)	16.29	15.73	15.73	16.07	15.96	0	7
<b>Sugars and confectionary</b>							
(Biscuits, salty)	23.94	29.78	29.78	23.54	26.76	0	7
(Sugar, brown)	10.25	10.25	10.25	10.25	10.25	0	7
(Sweets)	25.13	24.63	24.75	25	24.88	0	7
Chini, sada (Sugar, white)	5.31	5.14	5.18	5.29	5.23	0	14
Cookes (Packet/Brand) (Cookies)	21.71	21.76	21.76	21.76	21.75	0	14
Cookies (Bakery) (Cookies (Bakery))	23.88	23.88	23.88	23.88	23.88	0	7
Modhu (Honey)	79.04	79.04	79.04	79.04	79.04	0	7
<b>Herbs, spices and condiments</b>							
Ada (Ginger root, raw)	13.55	19.68	20.18	17.55	17.74	0	14
Darchini gura (Cinnamon, ground)	30	29	29	30	29.5	0	7
Dhone pata (Coriander leaf, raw)	11.84	12.63	13.15	11.99	12.4	0	14
Elach (Cardamom, seeds)	103.4	101.04	101.04	103.4	102.22	0	7
Golmorich (Pepper, black)	87.36	88.79	89.5	87.36	88.25	0	14
Holud (Turmeric, dried)	18.92	18.8	18.69	19.77	19.05	7	14
Jira (Cumin, seeds)	67.7	65.87	66.2	66.37	66.54	0	14
Kancha morich (Chilli, green, with seeds, raw)	13.05	15.95	16.45	14.78	15.06	7	14
Lebu, Kagoji (Lemon, kagoji)	6.41	9.76	12.26	9.23	9.42	0	14
Lobon (Salt)	0.88	0.87	0.87	0.88	0.87	7	14
Mauri (Fennel, seeds)	26	25.5	25.5	26	25.75	0	7
Pudina pata (Spearment leaf, raw)	19.55	19.55	19.55	19.55	19.55	0	7
Rosun (Garlic, raw)	12.33	16.36	16.64	14.64	14.99	7	14
Shukna morich (Chilli, red, dry)	21.42	21.17	21.58	21.58	21.44	0	14
<b>Beverages</b>							
Cha pata (Tea, powder)	73.63	72.27	72.27	73.05	72.81	7	14
Coffee (Coffee, powder)	133.33	133.33	133.33	133.33	133.33	0	0
Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	10.43	10.43	10.43	10.43	10.43	0	14
Green Tea (Herb, tea, shih)	55.05	55.05	55.05	55.05	55.05	0	7
Komol paniyo (Beverage, carbonated)	7.93	7.91	7.91	7.91	7.92	0	14

**Annex 1.6. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Rajanpur Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	24.4	24.4	24.35	24.4	24.39	0	7
(Millet, pearl, local)	3.32	3.32	3.34	3.32	3.32	0	0
(Rice, flaked)	3.5	3.5	3.5	3.5	3.5	0	0
(Vermicelli)	11.4	11.32	11.43	11.32	11.36	0	7
(Wheat, flour, maida)	5	5	5	5	5.0	0	0
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.82	3.87	3.84	3.87	3.85	0	7
Ata, Sada, Packet (Wheat, flour, white)	3.69	3.69	3.63	3.69	3.67	0	7
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	11.08	11.13	10.63	11.25	11.02	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	4.13	4.1	4.08	4.1	4.1	0	7
Rice (Toota Chawal) (Rice, grain or flour)	6.4	6.44	6.29	6.48	6.4	0	7
Sooji, gom (Semolina, wheat, raw)	4.82	4.75	4.77	4.8	4.78	0	7
Wheat flour white (Wheat, flour, white, refined)	4	4	4	4	4.0	0	0
Wheat, flour, brown, whole (Wheat, whole, raw)	3.86	3.86	3.86	3.86	3.86	0	7
Wheat, local or hyv (Wheat, hyv)	3.25	3.25	3.25	3.25	3.25	0	14
<b>Roots and tubers</b>							
(Horseradish)	1.35	1.3	1.4	1.37	1.35	0	7
(Potato)	3.48	3.73	5.58	3.67	4.11	0	14
(Sago palm, starch)	2.22	1.87	2	1.87	2.0	0	7
Beet (Beet root, red, raw)	5		4.5		4.57	0	0
Bon Alu, bivinno projati (Yam, raw)		4.5	4.57	3	4.47	0	0
Dudh kochu (Colocasia, taro or tannia, raw)	4.5	4.63	4	4.5	4.29	0	7
Misti alu, holdey (Sweet potato, pale yellow flesh, raw)	3.13	3	2	3	3.02	0	7
Shalgom (Turnip, raw)	2.87	2.79	3	2.81	2.83	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, mung)	12.81	12.9	12.62	13.01	12.83	0	7
Akhrot (Walnuts)	54	54	54	54	54.0	0	7
Arhar dal (Red gram, split, dried, raw)		20	20	20	20.0	0	0
Chilgoza (Chilgoza pine, dried)		200		200	200.0	0	0
China badam (Peanut, raw)	19.88	20.08	21.46	20.13	20.36	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	11.5	11.7	11.9	11.7	11.7	0	7
Gari kalai/Soyabean (Soybean, dried, raw)	15	17.5	17.5	17.5	17.14	0	0
Hizlee badam (Cashew nut, raw)		70	38.5	70	54.25	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	9.64	9.52	11.47	9.55	10.0	0	14

Maskalai dal, vanga (Black gram, split, dried, raw)	14.4	14.4	14.4	14.4	14.4	0	0
<b>Meat and offal</b>							
(Poultry)	26.15	24.67	21.04	24.33	24.05	0	14
<b>Fish, seafood, amphibians and invertebrates</b>							
Any Type (Fish)	35.45	40	26.67	40	37.0	0	7
Rui, nodir (Fish, rohu, river, raw)	29.38	29.38	28.33	29.38	29.26	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	19.3	18.82	16.58	19.49	18.55	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	17.27	17.21	15.65	17.27	16.85	0	14
<b>Milk and milk products</b>							
(Milk, curds)	8.2	8.3	8.29	8.2	8.25	0	14
(Milk, buffalo)	6.42	6.54	6.61	6.44	6.51	0	7
Chagoler dudh (Milk, goat)	5.56	5.56	5.56	5.56	5.56	0	0
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	5.66	5.68	5.61	5.66	5.65	0	7
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)	8	8	5.58	8	6.11	0	7
(Eggplant)	4.52	4.75	6.88	4.69	5.0	0	7
(Gourd, bottle)		3.75	3.32	3	3.37	0	7
(Gourd, ridge)		5	4.34		4.42	0	7
(Gourd, snake)		4	3.29		3.38	0	7
(Leaf, fenugreek)	3.85	3.95	4	3.91	3.9	0	7
(Mango, green)	3.5	7.75	10	3.5	8.41	0	7
(Onion, with stalks)	2.5	2.25	2.95	2.5	2.71	0	14
(Onion)	4.35	4.52	5.13	4.48	4.62	0	14
(Pumpkin)	3	4	3.28	3	3.36	0	7
Badhakopi (Cabbage, raw)	3.9	4.08	3	4.11	4.01	0	7
Dheros (Okra, raw)	9.5	9.17	6.08	9	7.11	0	7
Gajor (Carrot, raw)	2.74	2.77		2.89	2.8	0	14
Palong shak (Spinach, raw)	3.73	3.69	4	3.72	3.73	0	7
Shosa (Cucumber, peeled, raw)	3.23	3.17	6.8	3.37	3.5	0	14
<b>Fruit and fruit products</b>							
(Apple)	19.3	19.72	21.24	19.3	19.89	0	14
(Banana, ripe)	8.78	8.45	8.67	8.97	8.72	0	14
(Coconut, dried)		20	23.69	20	22.82	0	7
(Grapes, pale green)	10	11.8	11.15	10	11.14	0	14
(Mango, ripe)	10	7.2	7.96	10	8.03	0	14
(Melon, musk, other fruits)	2.67	3.86	3.83	3.25	3.68	0	14
(Plums)	24	30	14.79	24	19.13	0	7
(Tomato, green)	8	8	4.62	8	5.25	0	7
(Tomato, ripe)	13.04	14.26	15.36	13.33	14.0	0	14
Dumur, paka (Fig, ripe)	4	11	14.55	11	12.19	0	0

Khejur, paka, taza (Dates)	12.86	15.33	14	16	14.51	0	14
Khorma (Dates, dried)	12.6	12.56	11.8	12.44	12.34	0	7
Komola (Orange)	5.37	4.95	3.5	4.82	5.03	0	14
Lichu (Lychee)	47.5	35	49.83	35.33	43.21	0	7
Nashpati (Pear, asian)	8	15.75	12.67	14	13.21	0	7
Peyara, bivinno variety, kancha (Guava, green)	4.51	4.65	3.86	4.56	4.5	0	14
Tarmuz, lal, paka (Watermelon, ripe)	2	2.67	4.13	2.67	3.71	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	23.33	22	17.69	23	20.19	0	7
Zambura (Pomelo)		10	7.5	7.5	8.13	0	0
<b>Oils and fats</b>							
Dalda/Bonoshpati (Ghee, vegetable)	14.73	14.96	15	14.96	14.91	0	14
Ghee, gorur (Ghee, cow)	13.04	13.2	13.1	13.02	13.09	0	7
Makhon, nonta (Butter, salted)	100	100	100	100	100.0	0	7
Margarine (Margarine)	60	60	60	60	60.0	0	0
Sorishar tel (Oil, mustard)	19.55	19.88	19.38	19.47	19.57	0	7
Tiler tel (Oil, sesame)	8.7	8.7	8.7	8.7	8.7	0	0
<b>Sugars and confectionary</b>							
(Biscuits, salty)	45.55	45.55	44.4	45.55	45.26	0	7
(Sugar apple)						0	0
(Sugar, brown)	7	7	7	7	7.0	0	7
Chini, sada (Sugar, white)	5.46	5.55	5.52	5.54	5.52	0	14
Cookes (Packet/Brand) (Cookies)	37.64	37.64	37.27	37.64	37.55	0	14
Cookies (Bakery) (Cookies (Bakery))	17.18	17.24	18.24	17.4	17.52	0	7
Gur, Akh (Jaggery, sugarcane, solid)	6	6	6	6	6.0	0	7
Modhu (Honey)	80	80	80	80	80.0	0	7
<b>Herbs, spices and condiments</b>							
Ada (Ginger root, raw)	54.89	50.26	48.06	50.8	51.0	0	14
Darchini gura (Cinnamon, ground)	53.68	53.68	53.68	53.68	53.68	0	7
Dhone pata (Coriander leaf, raw)	44.53	43.5	42.48	43.5	43.5	0	14
Elach (Cardamom, seeds)	103.75	104.58	105.42	104.58	104.58	0	14
Golmorich (Pepper, black)	77.88	79.33	80.81	79.33	79.34	0	14
Holud (Turmeric, dried)	64.31	64	64	64	64.08	0	14
Jira (Cumin, seeds)	82	82	82	82	82.0	0	7
Kancha morich (Chilli, green, with seeds, raw)	16.31	16.23	15.83	16.31	16.17	7	14
Labongo (Cloves, dried)	180	180	180	180	180.0	0	7
Lebu, Kagoji (Lemon, kagoji)	24	24.58	23.92	24.33	24.21	0	14
Lobon (Salt)	1.07	1.07	1.07	1.07	1.07	7	14
Mauri (Fennel, seeds)	52.22	52.22	52.37	52.22	52.26	0	7
Rosun (Garlic, raw)	33.92	34.33	34.15	33.92	34.08	0	14
Shukna morich (Chilli, red, dry)	20.17	20.25	19.75	20	20.04	0	14
<b>Beverages</b>							
Cha pata (Tea, powder)	71.19	71.19	71.19	71.19	71.19	7	14
Komol paniyo (Beverage, carbonated)	9.89	9.89	9.89	9.89	9.89	0	14

**Annex 1.7. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Haveli Agriculture Livestock/Poultry Livelihood Zone**

Food Types	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>						Min	Max
(Bread, white)	8.73	8.73	8.73	8.73	8.73	0	7
(Maize, grain or flour, local)	4.09	4.09	4.09	4.09	4.09	0	7
(Vermicelli)	10.54	10.54	10.54	10.54	10.54	0	7
(Wheat, flour, maida)	5	5	5	5	5.0	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.99	3.99	3.99	3.99	3.99	0	0
Ata, Sada, Packet (Wheat, flour, white)	4.19	4.19	4.19	4.19	4.19	0	14
Bhutta, shukna (Maize, yellow, dried, raw)	3.71	3.71	3.71	3.71	3.71	0	14
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	14.77	14.77	14.77	14.77	14.77	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6.45	6.45	6.45	6.45	6.45	0	0
Rice (Toota Chawal) (Rice, grain or flour)	8.13	8.13	8.13	8.13	8.13	0	7
Sooji, gom (Semolina, wheat, raw)	6.08	6.08	6.08	6.08	6.08	0	7
Wheat flour white (Wheat, flour, white, refined)	6	6	6	6	6.0	0	7
Wheat, local or hyv (Wheat, hyv)	5	5	5	5	5.0	0	0
<b>Roots and tubers</b>							
(Horseradish)	4	4	4	4	4.0	0	7
(Potato)	4.4	4.98	3.96	5.63	4.74	0	14
Shalgom (Turnip, raw)	4			6.33	4.47	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	16.38	16.67	16.67	16.67	16.59	0	14
(Bean, mung)	12.46	12.96	12.96	12.96	12.83	0	7
(Cowpea)	12	12	12	12	12.0	0	7
Akhrot (Walnuts)	25				25.0	0	7
Arhar dal (Red gram, split, dried, raw)	20				20.0	0	7
China badam (Peanut, raw)	28	27.38	27.38	32.53	28.93	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	7.5				7.5	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	10	10	10	10	10.0	0	7
<b>Meat and offal</b>							
(Beef)	27.5	42.5	42.5	42.5	38.75	0	7
(Goat)	60	120	120	120	105.0	0	7
(Poultry)	20.34	17.98	15.05	21.07	18.61	0	14
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	28.04	22.65	22.65	22.65	24.0	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	20.35	16.96	15.33	18.07	17.68	0	7

Milk and milk products							
(Milk, buffalo)	9.87	9.87	9.87	9.87	9.87	0	7
Vegetables and vegetable products							
(Gourd, bitter)			8.42		8.42	0	7
(Eggplant)			6.55	6	6.52	0	7
(Gourd, snake)			5		5.0	0	14
(Leaf, fenugreek)	7.23	5.74	5.74	5.74	6.49	0	14
(Onion)	7.78	9.3	7.02	11.43	8.89	0	14
(Pumpkin)			10		10.0	0	7
Badhakopi (Cabbage, raw)	4.78	4	4	4	4.33	0	7
Dheros (Okra, raw)			8.15		8.15	0	7
Gajor (Carrot, raw)	5.93	6	6	5.83	5.93	0	7
Palong shak (Spinach, raw)	3.16	3.09	3.09	3.09	3.12	0	7
Shosa (Cucumber, peeled, raw)	6.4	7	6	6.33	6.4	0	14
Fruit and fruit products							
(Apple)	13.95	14	14.05	14.05	14.01	0	14
(Banana, ripe)	12.08	11.71	11.64	11.71	11.79	0	14
(Grapes, pale green)			18.33		18.33	0	7
(Mango, ripe)			15.22		15.22	0	7
(Melon, musk, other fruits)			8.29		8.29	0	7
(Plums)			77.33		77.33	0	7
(Tomato, green)	7			6	6.5	0	7
(Tomato, ripe)	11.13	12.95	8.73	16.3	12.31	0	14
Khejur, paka, taza (Dates)	18	18	17	18	17.6	0	7
Khorma (Dates, dried)						0	7
Komola (Orange)	13.48	22.41	22.41	22.41	14.87	0	14
Peyara, bivinno variety, kancha (Guava, green)	12.8	16	16	16	14.0	0	7
Tarmuz, lal, paka (Watermelon, ripe)			3.83		3.83	0	7
Oils and fats							
Dalda/Bonoshpati (Ghee, vegetable)	18.8	18.8	18.8	18.8	18.8	0	7
Ghee, gorur (Ghee, cow)	12.58	12.58	12.58	12.58	12.58	0	14
Makhon, nonta (Butter, salted)	80	80	80	80	80.0	0	7
Sorishar tel (Oil, mustard)	33.64	33.55	33.55	33.55	33.57	0	0
Sugars and confectionary							
(Biscuits, salty)	24.77	24.77	24.77	24.77	24.77	0	7
(Sweets)	25.33	25.33	25.33	25.33	25.33	0	7
Chini, sada (Sugar, white)	6.64	6.64	6.59	6.54	6.6	7	14
Cookes (Packet/Brand) (Cookies)	23.74	23.74	23.74	23.74	23.74	0	14
Cookies (Bakery) (Cookies (Bakery))	25.54	25.54	25.54	25.54	25.54	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	45.54	45.54	45.54	45.54	45.54	0	7
Darchini gura (Cinnamon, ground)	184.72	184.72	184.72	184.72	184.72	0	14
Dhone pata (Coriander leaf, raw)	8.99	8.99	8.57	8.99	8.88	0	14

Elach (Cardamom, seeds)	225.71	225.71	225.71	225.71	225.71	0	14
Golmorich (Pepper, black)	235.71	235.71	235.71	235.71	235.71	0	14
Holud (Turmeric, dried)	36.78	36.78	36.78	36.78	36.78	7	14
Jira (Cumin, seeds)	146.67	146.67	146.67	146.67	146.67	0	14
Kancha morich (Chilli, green, with seeds, raw)	18.5	18.5	17	18	18.0	0	14
Labongo (Cloves, dried)	188	188	188	188	188.0	0	14
Lebu, Kagoji (Lemon, kagoji)	18.86	20	20	18.67	19.38	0	7
Lobon (Salt)	2.22	2.22	2.22	2.22	2.22	7	14
Mauri (Fennel, seeds)	45	45	45	45	45.0	0	7
Pudina pata (Spearment leaf, raw)	20.61	20.61	20.61	20.61	20.61	0	14
Rosun (Garlic, raw)	29.27	28.91	27.45	29.82	28.86	0	14
Sarisha (Mustard, seeds)	12	12	12	12	12.0	0	0
Shukna morich (Chilli, red, dry)	31.08	31.08	31.08	31.08	31.08	7	14
Tejpata (Bay leaf, dried)	24	24	24	24	24.0	0	7
Beverages							
Cha pata (Tea, powder)	70.08	70.08	70.08	70.08	70.08	7	14
Green Tea (Herb, tea, shih)	100	100	100	100	100.0	0	14
Komol paniyo (Beverage, carbonated)	6.75	6.75	11.37	6.75	9.39	0	7

**Annex 1.8. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Haveli Livestock/Poultry Livelihood Zone**

Food Types	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
Grains and grain-based products							
(Bread, white)	8.63	8.63	8.63	8.63	8.63	0	7
(Maize, grain or flour, local)	8.5	8.5	8.5	8.5	8.5	0	14
(Vermicelli)	12.01	12.01	12.01	12.01	12.01	0	7
(Wheat, flour, maida)	6	6	6	6	6.0	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.65	3.65	3.65	3.65	3.65	0	0
Ata, Sada, Packet (Wheat, flour, white)	4	4	4	4	4.0	0	14
Bhutta, shukna (Maize, yellow, dried, raw)	3.5	3.5	3.5	3.5	3.5	0	14
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	14.8	14.8	14.8	14.8	14.8	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6	6	6	6	6.0	0	0
Rice (Toota Chawal) (Rice, grain or flour)	7.81	8.08	7.81	7.81	7.88	0	7
Sooji, gom (Semolina, wheat, raw)	6.04	6.04	6.04	6.04	6.04	0	7
Wheat flour white (Wheat, flour, white, refined)	4.1	4.1	4.1	4.1	4.1	0	7
Wheat, local or hyv (Wheat, hyv)	5.42	5.42	5.42	5.42	5.42	0	0
Roots and tubers							



(Horseradish)	4	4	4	4	4.0	0	7
(Potato)	4.13	4.75	3.6	5.46	4.48	0	14
Shalgom (Turnip, raw)	4	4	4	4.33	4.06	0	7
Legumes, nuts and seeds							
(Bean, kidney)	14.77	14.77	14.77	14.77	14.77	0	14
(Bean, mung)	12.08	12.08	12.08	12.08	12.08	0	7
(Cowpea)	12.1	12.1	12.1	12.1	12.1	0	7
Akhrot (Walnuts)	25			25	25.0	0	7
China badam (Peanut, raw)	28.82	28.82	28.82	28.82	28.82	0	7
Gari kalai/Soyabean (Soybean, dried, raw)	40	40	40	40	40.0	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	10			20	15.0	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	10.8	10.8	10.8	10.8	10.8	0	0
Meat and offal							
(Beef)	26	26	26	26	26.0	0	7
(Goat)	30	30	30	30	30.0	0	7
(Poultry)	20.1	16.7	12.75	20	17.39	0	14
Gorur mangsaw, kima (Beef, mince, lean, raw)	30	30	30	30	30.0	0	0
Fish, seafood, amphibians and invertebrates							
Any Type (Fish)	32				32.0	0	0
Rui, nodir (Fish, rohu, river, raw)	25				25.0	0	0
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	23.09	19	19	19	20.02	0	14
Murgir dim, farm er (Egg, chicken, farmed, raw)	18.38	15.74	13.37	16.56	16.01	0	7
Milk and milk products							
(Milk, buffalo)	10	10	10	10	10.0	0	14
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	10	10	10	10	10.0	0	7
Vegetables and vegetable products							
(Gourd, bitter)			8.06		8.06	0	7
(Eggplant)			6.06		6.06	0	7
(Gourd, bottle)			8		8.0	0	7
(Leaf, fenugreek)	5.86	6.24	6.24	6.13	6.05	0	14
(Onion, with stalks)	3.59				3.59	0	14
(Onion)	7.2	7.63	5.67	10.26	7.69	0	14
(Pumpkin)			5	4	4.86	0	7
Badhakopi (Cabbage, raw)	5	4.73	4.73	5.08	4.9	0	7
Dheros (Okra, raw)			7.73	8	7.77	0	7
Gajor (Carrot, raw)	6.69	6	6	6.4	6.37	0	7
Palong shak (Spinach, raw)	3.21	3.08	3.08	3.42	3.21	0	7
Shosa (Cucumber, peeled, raw)	5.6	5.33	5	5.8	5.44	0	14
Fruit and fruit products							

(Apple)	14.29	14.29	15.12	14.18	14.47	0	14
(Banana, ripe)	11.77	11.77	11.86	11.77	11.79	0	14
(Grapes, pale green)			17.78		17.78	0	7
(Mango, ripe)			15		15.0	0	14
(Melon, musk, other fruits)			7.83		7.83	0	7
(Plums)			20		20.0	0	7
(Tomato, ripe)	7.65	8.88	5.82	14.18	9.13	0	14
Khejur, paka, taza (Dates)	22	22	22	22	22.0	0	7
Khorma (Dates, dried)						0	7
Komola (Orange)	8.47				8.47	0	14
Peyara, bivinno variety, kancha (Guava, green)	12				12.0	0	7
Tarmuz, lal, paka (Watermelon, ripe)			4		4.0	0	7
Oils and fats							
Dalda/Bonoshpati (Ghee, vegetable)	20	20	20	20	20.0	0	14
Ghee, gorur (Ghee, cow)	13.06	13.06	13.06	13.06	13.06	0	7
Makhon, nonta (Butter, salted)	70	70	70	70	70.0	0	7
Sorishar tel (Oil, mustard)	35.47	35.47	35.47	35.47	35.47	0	0
Sugars and confectionary							
(Biscuits, salty)	25.33	25.33	25.33	25.33	25.33	0	7
(Sweets)	28	28	28	28	28.0	0	7
Chini, sada (Sugar, white)	6.48	6.48	6.48	6.48	6.47	7	14
Cookes (Packet/Brand) (Cookies)	25.52	25.52	25.52	25.52	25.52	0	14
Cookies (Bakery) (Cookies (Bakery))	26	26	26	26	26.0	0	7
Modhu (Honey)	60	60	60	60	60.0	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	46.33	46.33	46.33	46.33	46.33	0	7
Darchini gura (Cinnamon, ground)	199.64	199.64	199.64	199.64	199.64	0	14
Dhone pata (Coriander leaf, raw)	6.15	6.15	6.15	6.15	6.15	0	14
Elach (Cardamom, seeds)	242.73	242.73	242.73	242.73	242.73	0	14
Golmorich (Pepper, black)	207.27	207.27	207.27	207.27	207.27	0	14
Holud (Turmeric, dried)	27.67	27.67	27.67	27.67	27.67	7	14
Jira (Cumin, seeds)	155.2	155.2	155.2	155.2	155.2	0	14
Kancha morich (Chilli, green, with seeds, raw)	16.33	16.33	13.83	16.33	15.71	0	14
Labongo (Cloves, dried)	200	200	200	200	200.0	0	14
Lebu, Kagoji (Lemon, kagoji)	21.09	20.36	17.09	21.09	19.91	0	7
Lobon (Salt)	1.97	1.97	1.97	1.97	1.97	7	14
Mauri (Fennel, seeds)	140.5	140.5	140.5	140.5	140.5	0	7
Rosun (Garlic, raw)	30.55	30.73	30	30.55	30.45	0	14
Sarisha (Mustard, seeds)	12	12	12	12	12.0	0	0
Shukna morich (Chilli, red, dry)	28.61	28.61	28.61	28.61	28.61	7	14
Beverages							
Cha pata (Tea, powder)	69.58	69.58	69.58	69.58	69.58	7	14
Green Tea (Herb, tea, shih)	101.5	101.5	101.5	101.5	101.5	0	7
Komol paniyo (Beverage, carbonated)	25.3	25.3	25.3	25.3	25.3	0	7

**Annex I.9. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Loralai Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	67.66	67.66	67.66	67.66	67.66	0	7
(Millet, pearl, flour, local)	4.5	4.25	4	4.5	4.31	0	0
(Millet, pearl, local)	4.58	4.63	4.58	4.63	4.61	0	0
(Rice, flaked)	16	16	16	16	16.0	0	7
(Sorghum, grain or flour, local)	2.75	2.75	2.75	2.75	2.75	0	0
(Vermicelli)	10.62	10.6	10.6	10.62	10.61	0	7
(Wheat, flour, maida)	13.08	13	13	13.08	13.04	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.89	3.6	3.56	3.89	3.74	0	14
Ata, Sada, Packet (Wheat, flour, white)	5.5	3.6	3.63	3.62	4.09	0	14
Bhutta, shukna (Maize, yellow, dried, raw)	3.21	3.7	3.7	3.21	3.37	0	0
Jowar (Sorghum, raw)	2.63	2.63	2.63	2.63	2.63	0	0
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	14.3	13.9	13.8	14.3	14.07	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	12.29	12	11.97	12.29	12.14	0	7
Rice (Toota Chawal) (Rice, grain or flour)	6.29	6.21	6.19	6.29	6.24	0	7
Sooji, gom (Semolina, wheat, raw)	6.38	6.34	6.32	6.38	6.35	0	7
Wheat flour white (Wheat, flour, white, refined)	3.88	3.69	3.63	3.88	3.77	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	3.77	3.46	3.49	3.77	3.62	0	7
Wheat, local or hyv (Wheat, hyv)	2.56	2.8	2.71	3.01	2.77	0	7
<b>Roots and tubers</b>							
(Horseradish)	3.18	3.03	2.59	3.22	3.01	0	7
(Potato)	2.79	3.35	3.31	2.83	3.07	0	14
(Sago palm, starch)	50	75	100	50	68.75	0	7
Bon Alu, bivinno projati (Yam, raw)			5.33		5.33	0	7
Dudh kochu (Colocasia, taro or tannia, raw)			5		5.0	0	0
Shalgom (Turnip, raw)	3.73	3.52	3.45	3.73	3.61	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	13.6	13.33	13.33	13.6	13.47	0	7
(Bean, mung)	12.57	12.38	12.36	12.57	12.47	0	7
(Cowpea)	13	12.91	13	13	12.98	0	7
Akhrot (Walnuts)	52.14	52.14	50.14	52.29	51.68	0	7
Arhar dal (Red gram, split, dried, raw)	37	37	37	37	37.0	0	7
Chilgoza (Chilgoza pine, dried)	360	360	360	360	360.0	0	7
China badam (Peanut, raw)	40.48	39.76	41.11	40.48	40.44	0	7
Chola, shukna (Bengal gram, whole, dried, raw)	39.64	39.64	39.05	39.64	39.49	0	7

Gari kalai/Soyabean (Soybean, dried, raw)	70	70	70	70	70.0	0	0
Hizlee badam (Cashew nut, raw)	136.67	136.67	136.67	136.67	136.67	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	6.42	6.17	6.73	6.42	6.43	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	10	10	10	10	10.0	0	7
Pesta (Pistachio nuts, dried)	141.67	141.67	141.67	141.67	141.67	0	7
Til (Sesame, seeds, whole, dried)	40	40	40	40	40.0	0	0
<b>Meat and offal</b>							
(Beef)	34.67	33.83	33.83	34.67	34.25	0	7
(Goat)	50	50	50	50	50.0	0	7
(Poultry)	27.23	22.91	21.05	27.23	24.6	0	14
Gorur mangsaw, kima (Beef, mince, lean, raw)	42.6	41.6	41.6	42.6	42.1	0	7
<b>Fish, seafood, amphibians and invertebrates</b>							
Any Type (Fish)	26.29	26.2	26	26.29	26.25	0	7
Fish, Mahseer (Fish, carp, raw)	35	32		35	34.0	0	0
Mrigal, chokh soho (Fish, mrigal carp, eyes included, raw)	28	28		28	28.0	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	31.52	40.35	26.15	31.52	32.39	0	14
Murgir dim, farm er (Egg, chicken, farmed, raw)	21.42	18.58	18.44	21.27	19.93	0	14
<b>Milk and milk products</b>							
(Milk, curds)	8.83	8.83	8.88	8.83	8.84	0	7
(Milk, buffalo)	8.9	8.9	8.9	8.9	8.9	0	7
Chagoler dudh (Milk, goat)	8.07	7.95	7.95	8.07	8.01	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	8.27	8.27	8.27	8.27	8.27	0	7
Poneer (Cheese, cottage)	30	30	30	30	30.0	0	0
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)			80		80.0	0	7
(Eggplant)	4.38	4.33	4.33	4.38	4.35	0	7
(Gourd, bottle)	6.33	6.33	6.33	6.33	6.33	0	7
(Gourd, ridge)		7	6.5		6.75	0	7
(Leaf, fenugreek)	61.5	61.5	61.5	61.5	61.5	0	7
(Onion, with stalks)	8.97	8.97	8.97	8.97	8.97	7	14
(Onion)	4.63	4.58	4.63	4.63	4.61	0	14
(Pumpkin)	5.13	5.13	5.13	5.13	5.13	0	7
Badhakopi (Cabbage, raw)	4.39	4.35	4.39	4.39	4.38	0	7
Dheros (Okra, raw)	10.19	10.19	10.19	10.19	10.19	0	7
Gajor (Carrot, raw)	3.98	3.94	4.11	3.98	4.0	0	14
Kacha pepe siddha, lobon chara (Papaya, unripe, cooked)	8	8	8	8	8.0	0	0
Palong shak (Spinach, raw)	2.83	2.83	2.83	2.83	2.83	0	7

Shosa (Cucumber, peeled, raw)	5.63	5.58	5.63	5.63	5.61	0	14
Fruit and fruit products							
(Apple)	12.83	12.75	12.83	12.83	12.81	0	7
(Banana, ripe)	63.48	63.44	63.48	63.48	63.47	0	7
(Coconut, dried)	61	61	61	61	61.0	0	7
(Melon, musk, other fruits)		12			12.0	0	7
(Plums)	11.33	11.33	11.33	11.33	11.33	0	7
(Tomato, green)	4	4	4	4	4.0	0	7
(Tomato, ripe)	4.83	4.91	4.96	4.83	4.88	0	14
Dumur, paka (Fig, ripe)	59.43	59.43	59.43	59.43	59.43	0	7
Khejur, paka, taza (Dates)	19.55	19.55	19.55	19.55	19.55	0	7
Khorma (Dates, dried)	18.93	18.93	18.93	18.93	18.93	0	7
Komola (Orange)	5.88	5.83	5.88	5.88	5.86	0	14
Nashpati (Pear, asian)	30.36	30.36	30.36	30.36	30.36	0	7
Peyara, bivinno variety, kancha (Guava, green)	8.22	8.13	8.22	8.22	8.2	0	7
Tarmuz, lal, paka (Watermelon, ripe)	2.5	3.25	2.5	2.5	2.8	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	34.75	34.75	34.75	34.75	34.75	0	7
Oils and fats							
(Oil, castor)	95.56	95.56	95.56	95.56	95.56	0	0
(Oil, linseed)	186.16	186.16	186.16	186.16	186.16	0	0
(Oil, safflower)	65.22	65.22	65.22	65.22	65.22	0	0
(Oil, soybean)	18.66	18.66	18.66	18.66	18.66	0	0
Dalda/Bonoshpati (Ghee, vegetable)	28.62	28.49	28.46	28.62	28.55	0	14
Ghee, gorur (Ghee, cow)	13	12.96	12.96	12.96	12.97	0	14
Makhon, nonta (Butter, salted)	80	80	80	80	80.0	0	7
Margarine (Margarine)	55.3	55.87	55.87	55.87	55.73	0	7
Sorishar tel (Oil, mustard)	43.88	43.88	43.88	43.88	43.87	0	7
Tiler tel (Oil, sesame)	105.43	105.43	105.43	105.43	105.43	0	0
Sugars and confectionary							
(Biscuits, salty)	19.69	19.54	19.69	19.62	19.63	0	7
(Sugar, brown)	7	7	7	7	7.0	0	7
(Sugarcane)	5.92	5.67	5.6	5.92	5.78	0	7
(Sweets)	28.12	30.55	27.94	31.09	29.42	0	7
Akher Ross (Sugar cane, juice)	139.01	126.11	126.11	139.01	132.22	0	0
Chini, sada (Sugar, white)	5.68	5.54	5.52	5.72	5.61	0	14
Cookes (Packet/Brand) (Cookies)	44.69	44.69	44.69	44.69	44.69	0	14
Cookies (Bakery) (Cookies (Bakery))	23.17	23.17	23.11	23.17	23.15	0	7
Gur, Akh (Jaggery, sugarcane, solid)	7.45	7.4	7.38	7.45	7.42	0	7
Modhu (Honey)	78.5	78.17	75	78.5	77.54	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	69.07	69.07	69.07	69.07	69.07	0	14
Baking powder (Baking powder)	100	100	100	100	100.0	0	7
Darchini gura (Cinnamon, ground)	114.73	114.73	114.73	114.73	114.73	0	14

Dhone pata (Coriander leaf, raw)	32.75	32.75	33.64	32.75	32.97	0	14
Elach (Cardamom, seeds)	268.77	273.11	268.77	268.77	269.86	0	7
Golmorich (Pepper, black)	190.04	183.67	183.67	190.04	186.85	0	14
Holud (Turmeric, dried)	93.81	93.81	94.99	93.81	94.11	0	14
Jira (Cumin, seeds)	137.88	136.97	136.97	137.88	137.42	0	14
Kancha morich (Chilli, green, with seeds, raw)	12.93	12.97	12.75	12.77	12.85	0	14
Labongo (Cloves, dried)	273.6	271.6	271.6	273.6	272.6	0	14
Lebu, Kagoji (Lemon, kagoji)	57.65	57.8	58.2	57.65	57.83	0	14
Lemon ghas (Lemongrass, raw)	47.36	47.76	48.16	47.96	47.81	0	0
Lobon (Salt)	0.99	0.99	0.99	0.99	0.99	7	14
Mauri (Fennel, seeds)	29.33	29.33	29.33	29.33	29.33	0	7
Pudina pata (Spearment leaf, raw)	23.06	22.65	22.82	22.88	22.85	0	7
Rosun (Garlic, raw)	46.33	46.53	46.23	46.33	46.36	0	14
Sarisha (Mustard, seeds)	38.33	38.33	38.33	38.33	38.33	0	0
Shukna morich (Chilli, red, dry)	53.41	53.41	53.41	53.41	53.41	7	14
<b>Beverages</b>							
Cha pata (Tea, powder)	64.42	63.88	63.88	64.42	64.15	7	14
Coffee, dudh o chini soho (Coffee, infusion, with sugar and milk powder, whole fat)	200	200	200	200	200.0	0	7
Coffee (Coffee, powder)	186.67	186.67	186.67	186.67	186.67	0	7
Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	129.38	129.38	129.38	129.38	129.37	0	7
Green Tea (Herb, tea, shih)	48.74	48.65	48.65	48.74	48.7	0	14
Komol paniyo (Beverage, carbonated)	14.76	14.76	14.3	14.76	14.63	0	7
Lassi (Beverage, fruit flavoured)	17.92	15.54	15.78	17.92	16.67	0	14
<b>Composite dishes</b>							
Dheros-tomato bhuna (Okra and tomato bhuna)	66.94	66.94	66.94	66.94	66.94	0	7
Khichuri (Khichuri, plain)	157.14	157.14	157.14	157.14	157.14	0	7

**Annex I.10. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Naseerabad Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average		
Grains and grain-based products						Min	Max
(Bread, white)	12.02	12.02	12.02	12.02	12.02	0	7
(Maize, grain or flour, local)	12.08	12.08	12.08	12.08	12.08	0	0
(Millet, pearl, flour, local)	6	6	6	6	6.0	0	0
(Millet, pearl, local)	5.98	5.98	5.96	5.98	5.97	0	0
(Rice, flaked)	19	19.08	19.08	18.92	19.02	0	7
(Sorghum, grain or flour, local)	4.23	4.23	4.23	4.23	4.23	0	0
(Vermicelli)	10.71	10.71	10.71	10.71	10.71	0	7
(Wheat, flour, maida)	15.48	15.48	15.48	15.48	15.48	0	0
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.86	3.85	3.85	3.83	3.85	0	7
Ata, Sada, Packet (Wheat, flour, white)	3.66	3.66	3.66	3.66	3.66	0	0
Bhutta, shukna (Maize, yellow, dried, raw)	8	8	8	8	8.0	0	7
Jowar (Sorghum, raw)	4.09	4.09	4.09	4.09	4.09	0	0
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	8.96	9.11	8.96	8.96	9.0	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6.21	6.21	6.21	6.25	6.22	0	0
Rice (Toota Chawal) (Rice, grain or flour)	4.75	4.75	4.75	4.75	4.75	0	14
Sooji, gom (Semolina, wheat, raw)	7.73	7.73	7.81	7.73	7.75	0	7
Wheat flour white (Wheat, flour, white, refined)	3.96	3.97	3.94	3.96	3.96	0	0
Wheat, flour, brown, whole (Wheat, whole, raw)	4	4.06	4.04	4.03	4.03	0	7
Wheat, local or hyv (Wheat, hyv)	4.07	4.07	4.02	4.03	4.05	0	14
Roots and tubers							
(Horseradish)	2.01	2.31	2.22	1.95	2.13	0	7
(Potato)	4.77	4.96	5	4.96	4.92	0	14
Beet (Beet root, red, raw)	5.21	5.21	5.21	5.21	5.21	0	7
Bon Alu, bivinno projati (Yam, raw)	4.63	4.46	4.46	4.46	4.5	0	7
Misti alu, holdey (Sweet potato, pale yellow flesh, raw)	5.92	5.92	5.92	5.92	5.92	0	7
Shalgom (Turnip, raw)	3.08	3.08	3.13	3.13	3.1	0	7
Legumes, nuts and seeds							
(Bean, kidney)	8.58	8.58	8.58	8.58	8.58	0	7
(Bean, mung)	19.13	19.13	19.13	19.13	19.13	0	14



(Cowpea)	14.08	14.08	14.08	14.08	14.08	0	7
Akhrot (Walnuts)	73.67	74	73.67	74	73.83	0	0
Arhar dal (Red gram, split, dried, raw)	17.93	17.22	17.11	17	17.39	0	0
Chilgoza (Chilgoza pine, dried)	174.38	174.38	174.38	174.38	174.38	0	7
China badam (Peanut, raw)	37.36	37.36	37.36	37.36	37.36	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	43.53	43.53	43.53	43.53	43.53	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	12.21	12.21	12.21	12.21	12.21	0	14
Maskalai dal, vanga (Black gram, split, dried, raw)	11.54	11.54	11.54	11.54	11.54	0	7
Pesta (Pistachio nuts, dried)	120	120	120	120	120.0	0	0
Til (Sesame, seeds, whole, dried)	29.25	29.42	29.42	29.25	29.33	0	7
Meat and offal							
(Beef)	35.33	35.33	35.33	35.33	35.33	0	7
(Goat)	65.46	65.46	65.46	65.46	65.46	0	7
(Poultry)	30.22	29.47	29.31	29.39	29.6	0	14
Gorur mangsaw, kima (Beef, mince, lean, raw)	50.61	50.61	50.61	50.61	50.61	0	7
Fish, seafood, amphibians and invertebrates							
Any Type (Fish)	23.25	22.92	22.83	22.71	22.93	0	14
Mrigal, chokh soho (Fish, mrigal carp, eyes included, raw)	20	20	20	20	20.0	0	0
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	25.27	25.27	25.01	25.01	25.14	0	14
Murgir dim, farm er (Egg, chicken, farmed, raw)	21.83	21.51	21.51	21.83	21.67	0	7
Milk and milk products							
(Milk, curds)	12.96	12.96	12.96	12.96	12.96	0	14
(Milk, buffalo)	8.9	8.86	8.9	8.9	8.89	0	14
Chagoler dudh (Milk, goat)	8.33	8.33	8.33	8.33	8.33	0	14
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	8.65	8.65	8.65	8.65	8.65	0	14
Vegetables and vegetable products							
(Gourd, bitter)	9.35	7.38	7.46	7.92	7.97	0	7
(Eggplant)	2.85	2.85	2.85	2.81	2.84	0	7
(Gourd, bottle)	4.18	4.13	4.07	4	4.09	0	7
(Gourd, ridge)	4.53	4.22	4.27	4.22	4.29	0	7
(Mango, green)	5.06	4.91	4.95	4.96	4.96	0	7
(Onion, with stalks)	38.05	38.05	38.05	38.05	38.05	7	14
(Onion)	3.92	3.83	3.83	3.92	3.88	0	14
(Pumpkin)	3.75	3.83	3.88	3.75	3.8	0	7
Badhakopi (Cabbage, raw)	4.38	4.17	4.29	4.29	4.28	0	7
Dheros (Okra, raw)	9.58	7.58	8.08	7.63	8.22	0	14

Gajor (Carrot, raw)	3.73	3.85	3.81	3.85	3.81	0	14
Palong shak (Spinach, raw)	2.07	2.09	2.07	2.07	2.07	0	14
Shosa (Cucumber, peeled, raw)	3.71	3.58	3.67	3.54	3.63	0	14
Fruit and fruit products							
(Apple)	13.67	7.42	7.58	7.67	9.08	0	7
(Banana, ripe)	4.99	5.02	5.05	4.95	5.0	0	14
(Coconut, dried)	22.93	22.93	22.93	22.93	22.93	0	7
(Grapes, pale green)	6.86	6.5	6.75	6.92	6.74	0	7
(Mango, ripe)	5.47	5.54	5.5	5.54	5.52	0	14
(Melon, musk, other fruits)	2.27	2.3	2.33	2.33	2.31	0	7
(Plums)	4.2	4.35	4.35	4.32	4.31	0	7
(Tomato, green)	2.13	3.09	2.87	2.83	2.73	0	14
(Tomato, ripe)	4.75	8.63	8.33	7.75	7.36	0	14
Dumur, paka (Fig, ripe)	80.14	79.81	79.97	80.14	80.01	0	0
Khejur, paka, taza (Dates)	6.75	6.42	6.54	6.67	6.59	0	7
Khorma (Dates, dried)	5.29	5.29	5.29	5.29	5.29	0	7
Komola (Orange)	17.5	6	6	6	14.36	0	14
Lichu (Lychee)	100	100	100	100	100.0	0	0
Nashpati (Pear, asian)	18.59	16.7	16.65	16.83	17.17	0	0
Peyara, bivinno variety, kancha (Guava, green)	11.78	23.67	32.5	22.33	18.18	0	7
Tarmuz, lal, paka (Watermelon, ripe)	3	3.02	3.04	3.09	3.04	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	2.13	2.25	2.25	2.21	2.22	0	7
Oils and fats							
Dalda/Bonoshpati (Ghee, vegetable)	12.38	12.38	12.38	12.38	12.38	0	14
Ghee, gorur (Ghee, cow)	13.9	13.85	13.85	13.85	13.86	0	7
Makhon, nonta (Butter, salted)	132	132.67	132.33	132	132.25	0	14
Margarine (Margarine)	28.48	28.48	28.48	28.48	28.48	0	7
Sorishar tel (Oil, mustard)	19.68	19.68	19.68	19.68	19.68	0	0
Sugars and confectionary							
(Biscuits, salty)	81.61	81.61	81.61	81.61	81.61	0	7
(Sugar apple)						0	0
(Sugar, brown)	6.54	6.54	6.54	6.54	6.54	0	7
(Sugarcane)	5.21	5.21	5.21	5.21	5.21	0	7
(Sweets)	27	27	27	27	27.0	0	7
Akher Ross (Sugar cane, juice)	13.46	13.63	13.63	13.63	13.58	0	7
Chini, sada (Sugar, white)	5.34	5.43	5.43	5.33	5.38	7	14
Cookes (Packet/Brand) (Cookies)	53.04	53.04	53.04	53.04	53.04	0	7
Cookies (Bakery) (Cookies (Bakery))	27.15	27.15	27.15	27.15	27.15	0	7
Gur, Akh (Jaggery, sugarcane, solid)	18.46	18.46	18.46	18.46	18.46	0	7
Modhu (Honey)	168.54	168.54	168.54	168.54	168.54	0	7

Herbs, spices and condiments							
Ada (Ginger root, raw)	93.78	93.78	93.78	93.78	93.78	0	7
Baking powder (Baking powder)	142.9	142.9	142.9	142.9	142.9	0	0
Darchini gura (Cinnamon, ground)	119.72	119.72	119.72	119.72	119.72	0	7
Dhone pata (Coriander leaf, raw)	2.34	2.32	2.32	2.41	2.35	0	14
Elach (Cardamom, seeds)	171.8	171.8	171.8	171.8	171.8	0	7
Golmorich (Pepper, black)	152.76	152.76	154.84	152.76	153.28	0	14
Holud (Turmeric, dried)	134.59	134.59	134.59	134.59	134.59	0	7
Jira (Cumin, seeds)	127.71	127.71	127.71	127.71	127.71	0	7
Kancha morich (Chilli, green, with seeds, raw)	18.17	18.17	18.17	18.17	18.17	0	14
Labongo (Cloves, dried)	200	200	200	200	200.0	0	7
Lebu, Kagoji (Lemon, kagoji)	21.99	21.99	22.15	21.99	22.03	0	14
Lobon (Salt)	1.38	1.38	1.38	1.38	1.38	7	14
Mauri (Fennel, seeds)	109.94	109.94	109.94	109.94	109.94	0	7
Pan pata (Betel leaf, raw)	77.78	77.78	77.78	77.78	77.78	0	0
Pudina pata (Spearmint leaf, raw)	82.31	83.32	82.82	82.31	82.69	0	7
Rosun (Garlic, raw)	90.8	92.67	94.54	94.54	93.14	0	7
Sarisha (Mustard, seeds)	8.5	8.5	8.5	8.5	8.5	0	0
Shukna morich (Chilli, red, dry)	61.22	61.22	61.22	61.22	61.22	7	14
Beverages							
Cha pata (Tea, powder)	85.94	85.94	85.94	85.94	85.94	0	14
Green Tea (Herb, tea, shih)	93.01	93.01	93.01	93.01	93.01	0	7
Komol paniyo (Beverage, carbon-ated)	16.82	16.82	16.82	16.82	16.82	0	7
Lassi (Beverage, fruit flavoured)	14.06	14.06	14.06	14.06	14.06	0	14
Composite dishes							
Dheros-tomato bhuna (Okra and tomato bhuna)	80.13	80.79	80.46	80.13	80.38	0	14

**Annex I.II. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Jacobabad Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average		
Grains and grain-based products						Min	Max
(Bread, white)	42.33	42.33	42.33	42.26	42.31	0	7
(Millet, pearl, local)	3.26	3.5	3.3	3.26	3.33	0	0
(Rice, flaked)	8.01	8.05	8.14	8.01	8.05	0	7
(Vermicelli)	20.42	20.42	20.48	20.42	20.43	0	7
(Wheat, flour, maida)	6.49	6.46	6.49	6.49	6.48	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	5.48	5.51	5.47	5.48	5.48	0	7
Ata, Sada, Packet (Wheat, flour, white)	4.99	4.95	5.4	4.97	5.08	0	7
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	12.9	12.88	12.98	12.85	12.9	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6.39	6.51	6.74	6.39	6.51	0	7
Rice (Toota Chawal) (Rice, grain or flour)	5.11	5.18	5.16	5.11	5.14	0	7
Sooji, gom (Semolina, wheat, raw)	6.38	6.28	6.48	6.38	6.38	0	7
Wheat flour white (Wheat, flour, white, refined)	19.2	19.24	21.07	19.2	19.68	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	4.11	4.17	4.21	4.1	4.15	0	7
Wheat, local or hyv (Wheat, hyv)	5.5	6.22	5.7	5.5	5.73	0	7
Roots and tubers							
(Horseradish)	4.2	4.78	4.29	4.5	4.45	0	7
(Potato)	2.9	2.72	2.9	3.94	3.11	0	14
(Sago palm, starch)	5.45	6.91	7.61	5.68	6.31	0	7
Beet (Beet root, red, raw)	8	8	8	8	8.0	0	0
Bon Alu, bivinno projati (Yam, raw)	7	6.96	5.36	6.54	6.45	0	7

Dudh kochu (Colocasia, taro or tannia, raw)	5	5	5	5	5.0	0	7
Misti alu, holdey (Sweet potato, pale yellow flesh, raw)	5.77	5.85	5.65	5.89	5.79	0	0
Shalgom (Turnip, raw)	5.26	6.02	5.81	5.53	5.65	0	7
Legumes, nuts and seeds							
(Bean, kidney)	19	18.5	18.2	19	18.68	0	7
(Bean, mung)	14.03	14.12	13.95	14.2	14.08	0	14
(Cowpea)	13	13	13	13	13.0	0	0
China badam (Peanut, raw)	29.96	30.21	29.88	29.96	30.0	0	7
Chola, shukna (Bengal gram, whole, dried, raw)	13.51	13.58	14.14	13.51	13.69	0	0
Gari kalai/Soyabean (Soybean, dried, raw)	21.37	19.09	21.37	21.37	20.8	0	0
Hizlee badam (Cashew nut, raw)	150	158.33	150	150	152.08	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	16.09	13.9	23.11	23.87	19.24	0	14
Maskalai dal, vanga (Black gram, split, dried, raw)	15.81	18.69	17.83	16.38	17.18	0	0
Pesta (Pistachio nuts, dried)	201.28	192.95	192.95	201.28	197.12	0	7
Til (Sesame, seeds, whole, dried)	43.37	48.33	18.71	43.37	39.48	0	7
Meat and offal							
(Beef)	58.85	59.6	57.51	58.6	58.64	0	7
(Goat)	70.53	70.53	70.53	70.53	70.53	0	7
(Poultry)	34.88	36.54	32.43	29.33	33.3	0	14
Gorur mangsaw, kima (Beef, mince, lean, raw)	33	33	33	33	33.0	0	7
Fish, seafood, amphibians and invertebrates							
Any Type (Fish)	44.49	36.96	37.56	41	39.96	0	7
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	35.95	31.51	29.89	35.37	33.18	0	7

Murgir dim, farmer (Egg, chicken, farmed, raw)	31.04	25.86	22.14	29.6	27.16	0	14
Milk and milk products							
(Milk, curds)	12.26	12.3	12.09	12.26	12.23	0	14
(Milk, buffalo)	8.44	8.44	8.56	8.44	8.47	0	7
Vegetables and vegetable products							
(Gourd, bitter)	10.18	12.04	5.42	8.16	8.95	0	0
(Cucumber, raw)	6	6	1	6	4.75	0	7
(Eggplant)	3.17	4.94	3.71	3.2	3.76	0	7
(Gourd, bottle)	9	9.75	10.75	10	9.88	0	7
(Gourd, ridge)	9.18	11.47	4.62	7.94	8.3	0	7
(Gourd, snake)						0	0
(Leaf, fenugreek)	13.48	16.08	19.59	15.05	16.01	0	14
(Onion, with stalks)	6.45	13.14	8.03	6.65	8.59	7	14
(Onion)	7.23	5.38	4.88	9.92	6.85	0	7
(Pumpkin)	9.44	9.63	8.88	9.44	9.34	0	7
Badhakopi (Cabbage, raw)	5.08	5.27	5.25	5.09	5.17	0	7
Dheros (Okra, raw)	11.14	12.58	6.83	9.95	10.12	0	7
Gajor (Carrot, raw)	2.88	3.34	2.94	3.26	3.1	0	14
Kacha pepe siddha, lobon chara (Papaya, unripe, cooked)	12		12	12	12.0	0	0
Palong shak (Spinach, raw)	3.21	5.76	3.31	3.59	3.97	0	7
Shosa (Cucumber, peeled, raw)	5.98	8.34	5.8	6.46	6.64	0	7
Fruit and fruit products							
(Apple)	12.45	12.28	11.5	10.17	11.59	0	14
(Banana, ripe)	8	8.37	8.89	8.16	8.36	0	7
(Coconut, dried)	12.81	12.14	12.31	12.81	12.52	0	7
(Grapes, pale green)	12	12	14.67	12	12.89	0	7
(Mango, ripe)			22.5		22.5	0	14
(Tomato, green)	4.45	4.49	5.21	4.38	4.63	0	7
(Tomato, ripe)	4.58	4.25	5.71	7.49	5.51	7	14
Khejur, paka, taza (Dates)	9.08	9.78	9.25	9.17	9.32	0	7
Khorma (Dates, dried)	17.43	17.86	18.43	17.43	17.79	0	7
Komola (Orange)	8.56	7.08	8.65	9.22	8.39	0	7
Lichu (Lychee)	100	100	100	100	100.0	0	7

Peyara, bivinno variety, kancha (Guava, green)	6.65	7.89	4.74	6.71	6.5	0	14
Tarmuz, lal, paka (Watermelon, ripe)		1.5	1.5		1.5	0	14
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	12.4	12.4	12.8	12.4	12.5	0	7
Oils and fats							
(Oil, castor)	14.44	14.44	14.44	14.44	14.44	0	0
(Oil, soybean)	20.55	20.71	20.55	20.55	20.59	0	0
China badam er tel (Oil, peanut)	21.33	20.67	21.33	21.33	21.17	0	0
Dalda/Bonoshpati (Ghee, vegetable)	22.07	22.07	22.07	22.07	22.07	0	7
Ghee, gorur (Ghee, cow)	12.14	12.13	12.02	12.33	12.15	0	14
Makhon, nonta (Butter, salted)	60	54	60	56	57.5	0	7
Sorishar tel (Oil, mustard)	16.25	16.25	16.25	16.25	16.25	0	7
Tiler tel (Oil, sesame)	15.34	15.34	15.34	15.34	15.34	0	0
Sugars and confectionary							
(Biscuits, salty)	23.55	23.55	23.55	23.55	23.55	0	7
(Sugar apple)	28.57	28.57	28.57	28.57	28.57	0	0
(Sugar, brown)	10.57	9.29	10	10.57	10.11	0	7
(Sugarcane)	7.09	7.18	7.29	7.16	7.18	0	7
(Sweets)	8.68	8.68	8.73	8.61	8.68	0	7
Akher Ross (Sugar cane, juice)	6.73	6.73	6.73	6.73	6.73	0	7
Chini, sada (Sugar, white)	7.1	7.1	7.3	7.19	7.17	0	14
Cookes (Packet/Brand) (Cookies)	24	24	24	24	24.0	0	7
Cookies (Bakery) (Cookies (Bakery))	26.15	26.2	26.15	26.78	26.32	0	7
Gur, Akh (Jaggery, sugarcane, solid)	10.62	10.69	10.66	10.47	10.61	0	14
Modhu (Honey)	89.25	93.75	90.5	89.75	90.81	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	80.87	80.9	81.39	80.87	81.01	0	7
Baking powder (Baking powder)	54.99	54.99	54.99	54.99	54.99	0	7
Darchini gura (Cinnamon, ground)	66.29	66.29	66.29	66.29	66.29	0	7



Dhone pata (Corian-der leaf, raw)	39.06	39.06	39.06	39.06	39.06	0	14
Elach (Cardamom, seeds)	144.46	144.46	144.46	144.46	144.46	0	7
Golmorich (Pepper, black)	143.13	143.13	143.13	143.13	143.13	0	7
Holud (Turmeric, dried)	49.06	49.06	49.06	49.06	49.06	0	14
Jira (Cumin, seeds)	125.68	125.68	125.68	125.68	125.68	0	7
Kancha morich (Chil-li, green, with seeds, raw)	70	77.93	85.19	68.9	75.51	0	14
Labongo (Cloves, dried)	114.11	97.44	100.88	113.84	106.57	0	7
Lebu, Kagoji (Lem-on, kagoji)	16.89	17.33	25.44	16.89	19.14	0	7
Lemon ghas (Lem-ongrass, raw)	12.2	12.2	12.2	12.2	12.2	0	7
Lobon (Salt)	1.63	1.63	1.63	1.63	1.63	0	14
Mauri (Fennel, seeds)	57.97	75.29	69.08	69.08	67.86	0	7
Pudina pata (Spear-mint leaf, raw)	71.36	67.08	67.08	71.36	69.22	0	7
Rosun (Garlic, raw)	25.1	25.42	25.33	25.19	25.26	0	7
Sarisha (Mustard, seeds)	6.8	6.8	6.8	6.8	6.8	0	0
Shukna morich (Chil-li, red, dry)	25.81	25.81	25.81	25.81	25.81	0	14
Tejpata (Bay leaf, dried)	42.5	42.5	42.5	42.5	42.5	0	7
Beverages							
Cha pata (Tea, powder)	58.36	58.36	58.18	58.36	58.31	0	14
Coffee, dudh o chini soho (Coffee, infu-sion, with sugar and milk powder, whole fat)	10	10	10	10	10.0	0	0
Coffee (Coffee, powder)	41.91	41.91	41.91	41.91	41.91	0	0
Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	49.09	49.09	49.09	47.15	48.58	0	14
Green Tea (Herb, tea, shih)	50.82	50.82	50.38	50.38	50.59	0	7
Komol paniyo (Bev-erage, carbonated)	14	14	14.08	14	14.02	0	7
Lassi (Beverage, fruit flavoured)	11.5	11.5	11.5	11.5	11.5	0	7

**Annex I.12. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Sanghar Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	11.27	11.27	11.27	11.27	11.27	0	7
(Maize, grain or flour, local)	6.15	6.15	6.23	6.15	6.17	0	0
(Millet, pearl, flour, local)	8.71	8.71	8.86	8.71	8.75	0	7
(Millet, pearl, local)	5.16	5.26	5.26	5.26	5.24	0	0
(Rice, flaked)						0	0
(Sorghum, grain or flour, local)	5.86	5.86	5.86	5.86	5.86	0	0
(Vermicelli)	12.41	12.33	12.33	12.33	12.35	0	7
(Wheat, flour, maida)	10.36	9.88	9.88	9.67	9.95	0	0
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	4.56	4.56	4.56	4.56	4.56	0	7
Ata, Sada, Packet (Wheat, flour, white)						0	0
Bhutta, shukna (Maize, yellow, dried, raw)	5.79	5.79	5.86	5.79	5.8	0	7
Jowar (Sorghum, raw)	5.33	5.33	5.33	5.33	5.33	0	0
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	20.38	20.33	20.38	20.38	20.37	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6.98	6.98	6.98	6.98	6.98	0	7
Rice (Toota Chawal) (Rice, grain or flour)	9.67	9.67	9.67	9.67	9.67	0	7
Sooji, gom (Semolina, wheat, raw)	9.81	9.81	9.81	9.81	9.81	0	7
Wheat flour white (Wheat, flour, white, refined)	8.28	8.21	8.21	8.28	8.24	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	3.96	3.92	3.94	4.03	3.96	0	14
Wheat, local or hyv (Wheat, hyv)	6.44	6.5	6.44	6.53	6.48	0	14
<b>Roots and tubers</b>							
(Horseradish)	4.47	5.32	6.19	5.36	5.29	0	7
(Potato)	3.29	5.13	5.48	5.33	4.81	0	14
(Sago palm, starch)	14.64	14.64	14.64	14.64	14.64	0	0
Beet (Beet root, red, raw)	10.29	10.18	10.18	10.4	10.26	0	0
Bon Alu, bivinno projati (Yam, raw)	6.7	7.05	7.15	6.85	6.94	0	0
Dudh kochu (Colocasia, taro or tannia, raw)	10	10	10	10	10.0	0	0
Misti alu, holdey (Sweet potato, pale yellow flesh, raw)	8.5	8	8	8.5	8.25	0	7
Shalgom (Turnip, raw)	10.14	4.08	4.54	10.67	7.85	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	14.08	13.74	13.74	13.74	13.83	0	0
(Bean, mung)	15.64	15.64	15.64	15.64	15.64	0	7
(Bean, scarlet runner)						0	0
(Cowpea)	12.61	12.45	12.55	12.45	12.52	0	7
Akhrot (Walnuts)	117.73	116.53	116.33	116.93	116.88	0	0

Chilgoza (Chilgoza pine, dried)	249.14	248.86	248.86	249.71	249.14	0	0
China badam (Peanut, raw)	22.15	22.42	22.61	22.42	22.4	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	14	14	14	14	14.0	0	0
Gari kalai/Soyabean (Soybean, dried, raw)	270.4	270.4	270.4	270.4	270.4	0	0
Hizlee badam (Cashew nut, raw)	267.38	266.49	265.82	265.6	266.32	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	7.47	8.29	9.17	8.59	8.38	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	11.41	11.19	11.19	11.19	11.25	0	7
Pesta (Pistachio nuts, dried)	164.43	162.67	162.23	162.45	162.95	0	0
Til (Sesame, seeds, whole, dried)	39.99	39.66	39.66	39.66	39.74	0	0
<b>Meat and offal</b>							
(Beef)	28.61	28.61	28.61	28.61	28.61	0	7
(Goat)	58.53	58	58.42	58.21	58.29	0	7
(Poultry)	29.74	30.52	21.48	23.39	26.28	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	39.81	39.43	39.43	39.62	39.57	0	0
<b>Fish, seafood, amphibians and invertebrates</b>							
Any Type (Fish)	26.35	26.65	25.91	26.7	26.4	0	7
Fish, Mahseer (Fish, carp, raw)	26	26	26	26	26.0	0	0
Fish, Trout (Fish, indian river shad, raw)	23.5	23	23.5	24	23.5	0	0
Mrigal, chokh soho (Fish, mrigal carp, eyes included, raw)	17.33	18.67	16	17.33	17.33	0	0
Rui, nodir (Fish, rohu, river, raw)	27.38	27.3	27.17	27.5	27.34	0	0
Tuna, kata chara (Fish, tuna, boneless, raw)	30	28	30	32	30.0	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	32.93	25.11	19.68	21.64	24.84	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	21.79	16.21	13.29	14.26	16.39	0	7
<b>Milk and milk products</b>							
(Milk, curds)	11.52	11.52	11.52	11.52	11.52	0	14
(Milk, buffalo)	11.17	11.17	11.17	11.17	11.17	0	14
Chagoler dudh (Milk, goat)	9	9	9	9	9.0	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	16.33	16.33	16.33	16.33	16.33	0	7
Poneer (Cheese, cottage)	13	13	13	13	13.0	0	0
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)	10	8	4.5	10	7.5	0	0
(Cucumber, raw)						0	7
(Eggplant)	3.71	3.95	4.08	4.33	4.02	0	0
(Gourd, bottle)	4.87	5.55	5.68	5.27	5.34	0	7
(Gourd, ridge)	8	6.67	4	8	6.67	0	7
(Gourd, snake)	5	5	5.5	5	5.13	0	7
(Leaf, fenugreek)	5.43	5.65	5.55	5.85	5.62	0	7
(Mango, green)						0	14
(Onion, with stalks)	2.88	3	2.33	2.88	2.83	0	14

(Onion)	2.96	3.58	4.04	3.75	3.58	0	14
(Pumpkin)	4.67	5	5.13	5.2	5.0	0	7
Badhakopi (Cabbage, raw)	4.28	4.48	5.03	5.23	4.75	0	7
Dheros (Okra, raw)	15.73	13.33	12.53	14.4	14.0	0	7
Gajor (Carrot, raw)	4.26	4.83	5.74	5.52	5.09	0	14
Kacha pepe siddha, lobon chara (Papaya, unripe, cooked)	10.64	10.56	11.56	11.19	10.99	0	7
Palong shak (Spinach, raw)	3.21	3.96	4.42	4	3.9	0	7
Shosa (Cucumber, peeled, raw)	5.48	6.29	6.48	6.81	6.26	0	7
Fruit and fruit products							
(Apple)	19.36	19.64	20	19.64	19.66	0	7
(Banana, ripe)	11.95	13.46	12.77	12.48	12.66	0	14
(Coconut, dried)	35.82	35.82	35.45	35.82	35.73	0	0
(Grapes, pale green)						0	7
(Mango, ripe)						0	14
(Melon, musk, other fruits)						0	7
(Plums)						0	7
(Tomato, green)	3.63	9.83	10.33	6.89	7.67	0	14
(Tomato, ripe)	3.52	7.09	8.16	7.63	6.61	0	14
Dumur, paka (Fig, ripe)	105.89	107.21	106.33	106.97	106.6	0	0
Khejur, paka, taza (Dates)	19.88	19.76	19.18	19.76	19.65	0	7
Khorma (Dates, dried)	28.78	28.26	28.43	28.35	28.46	0	7
Komola (Orange)	10.38	12.08	15.29	12.75	12.42	0	7
Lichu (Lychee)	8	8	8	8	8.0	0	0
Nashpati (Pear, asian)	22.92	20.92	23.67	23.17	22.67	0	0
Peyara, bivinno variety, kancha (Guava, green)	4.18	4.92	5.33	4.91	4.81	0	7
Tarmuz, lal, paka (Watermelon, ripe)						0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	14.1	13.9	13.9	14.3	14.05	0	7
Zambura (Pomelo)	100	100	100		100.0	0	0
Oils and fats							
(Oil, castor)	80	80	80	80	80.0	0	0
(Oil, linseed)	80	80	80	80	80.0	0	0
(Oil, safflower)	139.2	139.2	139.2	139.2	139.2	0	0
(Oil, soybean)	108.8	108.8	108.8	108.8	108.8	0	0
China badam er tel (Oil, peanut)	93	93	93	93	93.0	0	0
Dalda/Bonoshpati (Ghee, vegetable)	16.75	16.75	16.75	16.75	16.75	0	14
Ghee, gorur (Ghee, cow)	16.5	16.5	16.5	16.5	16.5	0	14
Makhon, nonta (Butter, salted)	63.81	61.43	63.05	64	63.07	0	7
Margarine (Margarine)	60.4	66.8	68.4	66.8	65.6	0	0
Sorishar tel (Oil, mustard)	17.05	17.15	17.15	17.15	17.12	0	7
Tiler tel (Oil, sesame)	63.2	63.2	63.2	63.2	63.2	0	0
Sugars and confectionary							
(Biscuits, salty)	24.33	24.08	23.83	24.08	24.08	0	7
(Sugar apple)	18.67	19.33	19.33	18.67	19.0	0	0
(Sugar, brown)	5.5	5.5	5.5	5.5	5.5	0	0

(Sugarcane)	3.09	3.46	3.99	3.62	3.54	0	14
(Sweets)	39.61	39.43	39.26	39.26	39.39	0	7
Akher Ross (Sugar cane, juice)	8.36	8.91	9.47	8.64	8.85	0	7
Chini, sada (Sugar, white)	5.44	5.81	6.17	5.72	5.79	7	14
Cookes (Packet/Brand) (Cookies)	20.81	20.81	20.81	20.81	20.81	0	7
Cookies (Bakery) (Cookies (Bakery))	24.8	24.8	24.8	25.2	24.9	0	7
Gur, Akh (Jaggery, sugarcane, solid)	6.1	6.33	47.55	6.33	16.58	0	7
Modhu (Honey)	109.35	109.35	109.35	109.35	109.35	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	26.4	26.11	25.85	26.02	26.1	0	7
Baking powder (Baking powder)	17.82	17.82	17.82	17.82	17.82	0	0
Darchini gura (Cinnamon, ground)	54.5	54.37	54.82	54.82	54.63	0	7
Dhone pata (Coriander leaf, raw)	3.45	3.81	4.03	3.95	3.81	0	14
Elach (Cardamom, seeds)	138.49	132.49	132.49	132.49	133.99	0	14
Golmorich (Pepper, black)	83.36	83.15	83.15	83.15	83.2	0	14
Holud (Turmeric, dried)	44.26	43.49	43.49	43.49	43.68	0	14
Jira (Cumin, seeds)	84.19	84.45	84.01	84.45	84.27	0	14
Kancha morich (Chilli, green, with seeds, raw)	13.19	13.1	13.81	13.62	13.43	0	14
Labongo (Cloves, dried)	61.74	61.22	61.22	61.53	61.43	0	7
Lebu, Kagoji (Lemon, kagoji)	12.44	12.53	13.75	13.13	12.95	0	7
Lemon ghas (Lemongrass, raw)						0	0
Lobon (Salt)	5.35	7.87	7.97	7.97	7.29	7	14
Mauri (Fennel, seeds)	20.13	20.13	20.13	20.13	20.13	0	7
Pan pata (Betel leaf, raw)	66.67	100	100	66.67	83.34	0	7
Pudina pata (Spearment leaf, raw)	17.22	18.95	20.51	18.04	18.68	0	7
Rosun (Garlic, raw)	17.5	17.1	17.1	17.4	17.27	0	14
Sarisha (Mustard, seeds)	18.27	18.27	18.27	18.27	18.27	0	0
Shukna morich (Chilli, red, dry)	24.09	24	24.35	24.52	24.24	7	14
Tejpata (Bay leaf, dried)	9.67	9.67	9.67	9.67	9.67	0	7
Beverages							
Cha pata (Tea, powder)	65.64	65.64	65.64	65.64	65.64	7	14
Coffee, dudh o chini soho (Coffee, infusion, with sugar and milk powder, whole fat)	13.47	13.47	13.47	13.47	13.47	0	7
Coffee (Coffee, powder)	81.41	81.41	81.41	81.41	81.41	0	0
Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	28.21	18.02	18.21	18.21	20.66	0	7
Green Tea (Herb, tea, shih)	31.44	32.95	31.44	32.95	32.2	0	7
Komol paniyo (Beverage, carbonated)	9.41	9.41	9.41	9.41	9.41	0	7
Lassi (Beverage, fruit flavoured)	12.02	12.02	12.64	12.02	12.18	0	14
Composite dishes							
Dheros-tomato bhuna (Okra and tomato bhuna)	59.2	59.2	59.2	59.2	59.2	0	7
Khichuri (Khichuri, plain)	31.33	31.33	31.33	31.33	31.33	0	7

**Annex I.13. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Sanghar Livestock/Poultry Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	13.23	13.12	13.12	13.12	13.15	0	7
(Maize, grain or flour, local)	6.11	5.84	5.97	5.97	5.97	0	0
(Millet, pearl, flour, local)	6.41	6.41	6.41	6.41	6.41	0	7
(Millet, pearl, local)	4.71	4.71	4.61	4.71	4.68	0	0
(Rice, flaked)	50	50	50	50	50.0	0	0
(Sorghum, grain or flour, local)	6.05	5.99	5.99	6.05	6.02	0	0
(Vermicelli)	11	11	11.02	11	11.01	0	7
(Wheat, flour, maida)	8.57	8.57	8.55	8.57	8.56	0	0
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	5.62	5.62	5.62	5.62	5.62	0	7
Bhutta, shukna (Maize, yellow, dried, raw)	4.71	4.67	4.69	4.7	4.69	0	7
Jowar (Sorghum, raw)	4.99	4.99	4.99	4.99	4.99	0	0
Rice (Banaspoti) (Rice, white, sunned, aromatic, raw)	13.15	12.89	12.97	13.06	13.02	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	6.01	6.01	6.01	6.01	6.01	0	7
Rice (Toota Chawal) (Rice, grain or flour)	5.66	5.66	5.66	5.66	5.66	0	7
Sooji, gom (Semolina, wheat, raw)	9.2	9.2	9.2	9.2	9.2	0	7
Wheat flour white (Wheat, flour, white, refined)	5.19	5.13	5.15	5.15	5.15	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	5.39	5.38	5.43	5.39	5.4	0	14
Wheat, local or hyv (Wheat, hyv)	4.44	4.44	4.44	4.44	4.44	0	14
<b>Roots and tubers</b>							
(Horseradish)	2.96	3.33	3.41	3.15	3.17	0	7
(Potato)	2.48	3.29	3.57	3.18	3.13	0	14
(Sago palm, starch)	14.27	14.27	14.27	14.43	14.31	0	0
Beet (Beet root, red, raw)	10.75	10.4	10.4	10.61	10.54	0	0
Bon Alu, bivinno projati (Yam, raw)	8.54	8.54	8.47	8.6	8.54	0	0
Dudh kochu (Colocasia, taro or tannia, raw)	11.33	11	11	11.33	11.17	0	0
Misti alu, holdey (Sweet potato, pale yellow flesh, raw)	9.13	9.13	8.88	9.13	9.06	0	7
Shalgom (Turnip, raw)	5.45	5.31	5.57	5.56	5.48	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	21.47	21.47	21.47	21.47	21.48	0	0
(Bean, mung)	16.45	16.33	16.42	16.42	16.4	0	7
(Cowpea)	12.33	12.15	12.15	12.24	12.22	0	7
Akhrot (Walnuts)	122.27	122.07	122.27	122.07	122.17	0	7

Chilgoza (Chilgoza pine, dried)	344.56	345	344.78	345	344.83	0	0
China badam (Peanut, raw)	18.74	104.08	18.74	18.84	40.1	0	7
Chola, shukna (Bengal gram, whole, dried, raw)	15.05	15.05	15.05	15.14	15.07	0	7
Gari kalai/Soyabean (Soybean, dried, raw)	27.47	27.47	27.47	27.47	27.47	0	0
Hizlee badam (Cashew nut, raw)	158.55	158.18	158.36	158.55	158.41	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	14.67	15.1	15.39	14.96	15.03	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	12.2	12.2	12.3	12.3	12.25	0	7
Pesta (Pistachio nuts, dried)	169.9	168.76	168.57	168.95	169.05	0	0
Til (Sesame, seeds, whole, dried)	49.84	49.84	49.84	49.84	49.84	0	0
<b>Meat and offal</b>							
(Beef)	29.69	29.69	29.61	29.69	29.67	0	7
(Goat)	59.27	58.91	59.27	59.09	59.14	0	7
(Poultry)	30.42	26.5	25.92	27.08	27.48	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	39.14	39.14	39.14	39.14	39.14	0	7
<b>Fish, seafood, amphibians and invertebrates</b>							
Any Type (Fish)	29.03	28.77	27.23	28.41	28.36	0	7
Fish, Mahseer (Fish, carp, raw)	20	20	20	20	20.0	0	0
Fish, Trout (Fish, indian river shad, raw)	22	22	22	22	22.0	0	0
Mrigal, chokh soho (Fish, mrigal carp, eyes included, raw)	20.5	20.5	20.25	20.5	20.44	0	0
Rui, nodir (Fish, rohu, river, raw)	28.47	28.35	27.88	29.06	28.44	0	0
Tuna, kata chara (Fish, tuna, boneless, raw)	31.2	30.4	30	31.6	30.8	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	50.71	30.33	25.55	28.99	33.9	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	20.21	16.77	14.64	16.44	17.02	0	14
<b>Milk and milk products</b>							
(Milk, curds)	13.01	12.83	12.92	12.92	12.92	0	14
(Milk, buffalo)	8.29	8.29	8.29	8.29	8.29	0	14
Chagoler dudh (Milk, goat)	10.44	10.44	10.44	10.44	10.44	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	8.89	8.89	8.89	8.89	8.89	0	7
Poneer (Cheese, cottage)	13	13	13	13	13.0	0	0
<b>Vegetables and vegetable products</b>							
(Gourd, bitter)	13.57	18.5	16.25	13	15.47	0	0
(Eggplant)	3.67	3.88	3.75	3.88	3.79	0	7
(Gourd, bottle)	4.05	4.23	5	4.23	4.38	0	7
(Gourd, ridge)	8	7.33	4	7.56	6.72	0	7
(Gourd, snake)	5	6	6	5	5.5	0	7
(Leaf, fenugreek)	5.87	6.05	5.73	5.87	5.88	0	7
(Onion, with stalks)	3.38	3.8	3.2	3.46	3.44	7	14



(Onion)	2.77	3.4	3.86	3.44	3.37	0	14
(Pumpkin)	4.47	4.68	4.5	4.63	4.57	0	7
Badhakopi (Cabbage, raw)	3.91	4.52	3.89	4.2	4.13	0	7
Dheros (Okra, raw)	9.46	8.13	5.9	8.13	7.9	0	14
Gajor (Carrot, raw)	4.96	5.74	5.57	5.63	5.47	0	7
Kacha pepe siddha, lobon chara (Papaya, unripe, cooked)	11.82	12	11.82	12	11.91	0	7
Palong shak (Spinach, raw)	2.87	3.17	3.52	3.13	3.17	0	7
Shosa (Cucumber, peeled, raw)	8.3	9.39	7.61	9.35	8.66	0	7
Fruit and fruit products							
(Apple)	72.48	73	21.78	72.91	60.04	0	7
(Banana, ripe)	11.61	13.82	14.71	13.04	13.29	0	14
(Coconut, dried)	54.89	54.89	58.53	54.9	55.79	0	0
(Tomato, green)	4.33	10.43	9.43	6.62	7.7	0	14
(Tomato, ripe)	3.58	9.54	9.92	8.63	7.92	7	14
Dumur, paka (Fig, ripe)	113.58	113.58	113.58	113.58	113.58	0	0
Khejur, paka, taza (Dates)	30	30.4	28.27	30	29.67	0	7
Khorma (Dates, dried)	20.09	20.26	20.37	20.09	20.2	0	7
Komola (Orange)	4.88	5.43	5.18	5.04	5.13	0	14
Lichu (Lychee)	8.5	8.5	8.5	8.5	8.5	0	0
Nashpati (Pear, asian)	28.92	28.68	28.58	28.92	28.77	0	0
Peyara, bivinno variety, kancha (Guava, green)	3.7	4.65	4.92	4.45	4.38	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	12.74	12.53	12.84	12.84	12.74	0	7
Zambura (Pomelo)	54.5	54.5	54.5	39.33	51.47	0	7
Oils and fats							
(Oil, castor)	118.14	118.14	118.14	118.14	118.14	0	0
(Oil, linseed)	81.09	81.09	81.09	81.09	81.09	0	0
(Oil, safflower)	157.11	157.11	157.11	157.11	157.11	0	0
(Oil, soybean)	65.82	65.82	65.82	65.82	65.82	0	0
China badam er tel (Oil, peanut)	120	120	120	120	120.0	0	0
Dalda/Bonoshpati (Ghee, vegetable)	13.69	13.69	13.69	13.69	13.69	0	14
Ghee, gorur (Ghee, cow)	13.65	13.65	13.65	13.65	13.65	0	14
Makhon, nonta (Butter, salted)	70.6	70.2	69.4	70.2	70.1	0	7
Margarine (Margarine)	61.56	61.56	61.56	61.56	61.56	0	0
Sorishar tel (Oil, mustard)	23.13	23.13	23.13	23.13	23.13	0	7
Tiler tel (Oil, sesame)	60.67	60.67	60.67	60.67	60.67	0	0
Sugars and confectionary							
(Biscuits, salty)	28.69	28.57	28.57	28.46	28.57	0	7
(Sugar apple)	15.64	15.93	15.93	15.64	15.78	0	0
(Sugar, brown)	5.8	5.8	5.8	5.8	5.8	0	0
(Sugarcane)	1.93	1.98	2.17	1.98	2.01	0	7
(Sweets)	56.46	56.46	56.46	56.46	56.46	0	7
Akher Ross (Sugar cane, juice)	8.75	8.87	9.13	8.75	8.88	0	7

Chini, sada (Sugar, white)	5.34	5.42	5.5	5.34	5.4	0	14
Cookies (Packet/Brand) (Cookies)	23.72	23.72	23.72	23.72	23.72	0	7
Cookies (Bakery) (Cookies (Bakery))	22.57	22.48	22.29	22.48	22.45	0	7
Gur, Akh (Jaggery, sugarcane, solid)	5.68	5.68	5.64	5.77	5.69	0	7
Modhu (Honey)	93.95	93.95	93.95	93.95	93.95	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	16.86	16.86	16.86	16.86	16.86	0	14
Baking powder (Baking powder)	18.55	18.55	18.55	18.55	18.56	0	0
Darchini gura (Cinnamon, ground)	57.87	57.87	57.87	57.87	57.87	0	7
Dhone pata (Coriander leaf, raw)	5.67	5.94	6.36	5.96	5.98	0	14
Elach (Cardamom, seeds)	142.37	139.04	139.04	141.46	140.48	0	14
Golmorich (Pepper, black)	90.98	90.98	90.98	91.19	91.03	0	14
Holud (Turmeric, dried)	36.56	36.3	36.56	36.56	36.49	0	14
Jira (Cumin, seeds)	91.83	91.83	91.83	91.83	91.83	0	14
Kancha morich (Chilli, green, with seeds, raw)	20.12	19.93	20.3	20.3	20.16	0	14
Labongo (Cloves, dried)	83.01	82.72	82.72	82.82	82.82	0	7
Lebu, Kagoji (Lemon, kagoji)	14.64	15.34	16.34	14.94	15.32	0	7
Lobon (Salt)	3.36	3.36	3.36	3.36	3.36	7	14
Mauri (Fennel, seeds)	27.6	27.6	27.6	27.6	27.6	0	7
Pan pata (Betel leaf, raw)	67.62	67.62	67.62	67.62	67.62	0	7
Pudina pata (Spearmint leaf, raw)	28.07	28.07	28.07	28.17	28.1	0	7
Rosun (Garlic, raw)	17.36	17.18	17.27	17.18	17.25	0	14
Sarisha (Mustard, seeds)	22.4	22.4	22.4	22.4	22.4	0	0
Shukna morich (Chilli, red, dry)	25.67	26.17	26.25	25.58	25.92	0	14
Tejpata (Bay leaf, dried)	9.75	10.47	10.47	9.75	10.11	0	7
Beverages							
Cha pata (Tea, powder)	72.92	72.92	72.92	72.92	72.92	0	14
Coffee (Coffee, powder)	105.96	105.96	105.96	105.96	105.96	0	0
Doodh Patti (Tea, infusion, with sugar and milk powder, whole fat)	18.66	18.66	18.66	18.66	18.66	0	14
Green Tea (Herb, tea, shih)	46.18	46.18	46.18	46.18	46.18	0	7
Komol paniyo (Beverage, carbonated)	19.52	19.52	19.52	19.52	19.51	0	7
Lassi (Beverage, fruit flavoured)	11.82	11.82	12.2	11.82	11.91	0	14
Composite dishes							
Dheros-tomato bhuna (Okra and tomato bhuna)	50.08	50.08	46.96	50.08	49.3	0	14
Khichuri (Khichuri, plain)	20	20	20	20	20.0	0	7

**Annex I.14. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Gilgit Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average		
<b>Grains and grain-based products</b>						Min	Max
(Bread, white)	9.51	9.59	9.51	9.51	9.53	0	7
(Vermicelli)	16.89	16.89	16.89	16.89	16.89	0	7
(Wheat, flour, maida)	7.21	7.12	7.05	7.21	7.15	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3	3	3	3	3.0	0	7
Ata, Sada, Packet (Wheat, flour, white)	1.55	1.55	1.55	1.55	1.55	0	14
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	14.63	14.58	14.58	14.63	14.6	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	7	7	7	7	7.0	0	0
Rice (Toota Chawal) (Rice, grain or flour)	9.22	9.09	9.17	9.22	9.17	0	7
Sooji, gom (Semolina, wheat, raw)	6.89	6.64	6.6	6.89	6.76	0	7
Wheat flour white (Wheat, flour, white, refined)	5	5	5	5	5.0	0	7
<b>Roots and tubers</b>							
(Horseradish)	4.3	3.48	2.97	4.35	3.78	0	14
(Potato)	4.2	3.39	2.69	4.2	3.62	0	14
Shalgom (Turnip, raw)	4.05	3.16	2.45	4.05	3.43	0	14
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	14.39	14.22	14.35	14.39	14.34	0	7
(Bean, mung)	13.26	13.3	13.26	13.26	13.27	0	7
(Cowpea)	18.62	19.3	19.17	18.62	18.93	0	7
Akhrot (Walnuts)	25.86	25.86	25.86	25.86	25.86	0	14
Arhar dal (Red gram, split, dried, raw)	30	30	30	30	30.0	0	7
China badam (Peanut, raw)	33.67	21.17	20.75	21.53	25.31	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	15.2	15.2	14.4	15.2	15.0	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	17	17	16	17	16.75	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	14.59	14.71	14.41	14.59	14.57	0	7
<b>Meat and offal</b>							
(Beef)	34	26.5	26.5	34	30.25	0	7
(Goat)	54	54	56	54	54.5	0	7
(Poultry)	36.95	33.6	31.05	36.7	34.58	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	45	45	45	45	45.0	0	0
<b>Eggs and egg products</b>							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	21.6	18.67	16.17	21.6	19.51	0	14
Murgir dim, farm er (Egg, chicken, farmed, raw)	19.27	16.87	15.26	19.27	17.64	0	7

Milk and milk products							
(Milk, curds)	10.45	10.45	10.27	10.45	10.41	0	0
(Milk, buffalo)	12.97	12.8	12.56	12.97	12.83	0	14
Vegetables and vegetable products							
(Eggplant)	6.25	4.5	4.15	6.25	4.72	0	7
(Gourd, bottle)	7	6.17	7.29	7	6.82	0	7
(Gourd, ridge)	6		4	6	5.33	0	0
(Leaf, fenugreek)	3	3.8	3.86	3	3.71	0	7
(Onion, with stalks)		4	3.23		3.38	7	14
(Onion)	7.8	6.09	4.43	7.8	6.53	0	14
(Pumpkin)		3.1	3.4		3.3	0	7
Badhakopi (Cabbage, raw)	4.9	3.63	2.8	4.9	4.06	0	7
Dheros (Okra, raw)		5.25	5.09		5.14	0	7
Gajor (Carrot, raw)	4.95	3.74	2.82	4.95	4.12	0	14
Palong shak (Spinach, raw)	5.57	2.64	2.99	5.57	3.83	0	7
Shosa (Cucumber, peeled, raw)	6.71	4.38	3.48	6.71	5.25	0	14
Fruit and fruit products							
(Apple)	10	7.24	5.27	10	8.04	0	14
(Banana, ripe)	12.75	12.45	10.52	12.75	12.12	0	7
(Coconut, dried)	31	29.32	27.68	31	29.75	0	7
(Grapes, pale green)		4	5.25		5.18	0	7
(Mango, ripe)			13.74		13.74	0	7
(Melon, musk, other fruits)			7.34		7.34	0	7
(Plums)			3.5		3.5	0	14
(Tomato, ripe)	8.5	5.45	4.09	8.4	6.61	0	14
Dumur, paka (Fig, ripe)		5	5.83		5.77	0	7
Khejur, paka, taza (Dates)	20.92	20.19	20.62	20.92	20.66	0	7
Khorma (Dates, dried)	14.82	14.94	16.64	14.82	15.3	0	7
Komola (Orange)	7.8	8.03	8.03	7.77	7.87	0	14
Nashpati (Pear, asian)	16	9.33	5.87	16	7.4	0	7
Peyara, bivinno variety, kancha (Guava, green)	10.31	10.18	10	10.33	10.26	0	7
Tarmuz, lal, paka (Watermelon, ripe)			3.48		3.48	0	7
Oils and fats							
(Oil, castor)	100	100	100	100	100.0	0	0
Dalda/Bonoshpati (Ghee, vegetable)	15.44	15.31	15.31	15.31	15.34	0	0
Ghee, gorur (Ghee, cow)	13.33	13.33	13.33	13.33	13.33	0	7
Makhon, nonta (Butter, salted)	93.33	93.33	105.71	93.33	96.8	0	14
Margarine (Margarine)	52	57	57	52	54.5	0	0
Sorishar tel (Oil, mustard)	15.75	15.72	15.67	15.75	15.72	0	7
Sugars and confectionary							
(Biscuits, salty)	27.41	27.41	27.41	27.41	27.41	0	7
(Sugar, brown)	11.18	11.18	11.06	11.18	11.15	0	0
(Sugarcane)	10	10	10	10	10.0	0	0

(Sweets)	12.92	12.92	12.58	12.92	12.83	0	14
Chini, sada (Sugar, white)	7.91	7.86	7.8	7.91	7.87	0	14
Cookes (Packet/Brand) (Cookies)	33.83	34.3	34.3	33.83	34.06	0	7
Cookies (Bakery) (Cookies (Bakery))	27.44	27.44	27.22	27.44	27.39	0	7
Gur, Akh (Jaggery, sugarcane, solid)	18.33	18.33	18.33	18.33	18.33	0	7
Modhu (Honey)	65.89	65.89	65.89	65.89	65.89	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	31.9	31.91	28.75	31.9	31.11	0	14
Baking powder (Baking powder)	61.46	61.19	61.19	61.46	61.32	0	7
Darchini gura (Cinnamon, ground)	33.2	27.2	33.2	33.2	31.7	0	7
Dhone pata (Coriander leaf, raw)		5.63	4.22		4.88	0	14
Elach (Cardamom, seeds)	122.57	122.13	118.02	122.57	121.32	0	14
Golmorich (Pepper, black)	139.16	139.16	138.03	139.16	138.88	0	14
Holud (Turmeric, dried)	34.17	34.17	34.17	34.17	34.17	0	14
Jira (Cumin, seeds)	91.5	91.5	91.5	91.5	91.5	0	14
Kancha morich (Chilli, green, with seeds, raw)	16.42	9.8	8.06	16.42	12.23	0	14
Lebu, Kagoji (Lemon, kagoji)	19.71	14	12.57	19.71	16.5	0	7
Lobon (Salt)	3.17	3.17	3.17	3.17	3.17	7	14
Mauri (Fennel, seeds)	120	120	120	120	120.0	0	7
Pudina pata (Spearment leaf, raw)		6	4.75		5.17	0	14
Rosun (Garlic, raw)	28.3	24.92	24.2	28.3	26.43	7	14
Sarisha (Mustard, seeds)	28	28	28	28	28.0	0	0
Shukna morich (Chilli, red, dry)	28.69	28.69	27.77	28.69	28.46	0	7
Tejpata (Bay leaf, dried)	50	50	50	50	50.0	0	0
Beverages							
Cha pata (Tea, powder)	72.08	72.08	72.25	72.08	72.13	7	14
Green Tea (Herb, tea, shih)	111.75	111.75	111.75	111.75	111.75	0	14
Komol paniyo (Beverage, carbonated)	11.37	11.37	11.4	11.37	11.38	0	7
Lassi (Beverage, fruit flavoured)						0	14

**Annex I.15. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Gilgit Livestock/Poultry Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	10	10	9.43	10	9.85	0	7
(Millet, pearl, local)	6	6	5.4	6	5.85	0	0
(Vermicelli)	18.61	18.61	18.61	18.61	18.61	0	7
(Wheat, flour, maida)	7.25	7.2	7.22	7.25	7.23	0	7
Ata, Sada, Packet (Wheat, flour, white)	1.55	1.55	1.55	1.55	1.55	0	14
Bhutta, shukna (Maize, yellow, dried, raw)	2	2	2	2	2.0	0	7
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	15.25	15.25	15.04	15.25	15.2	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	9.67	9.67	9.33	9.67	9.58	0	7
Rice (Toota Chawal) (Rice, grain or flour)	9.04	9.04	8.92	9.04	9.01	0	7
Sooji, gom (Semolina, wheat, raw)	7.17	7.17	6.97	7.17	7.12	0	7
Wheat flour white (Wheat, flour, white, refined)	6.33	6.33	6.19	6.33	6.3	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	3	3	3	3	3.0	0	7
<b>Roots and tubers</b>							
(Horseradish)	4.63	4.42	2.75	4.63	4.1	0	14
(Potato)	4.08	4.13	3.17	4.08	3.87	0	14
Beet (Beet root, red, raw)	10	10	10	10	10.0	0	0
Bon Alu, bivinno projati (Yam, raw)	8	8	7.43	8	7.75	0	0
Shalgom (Turnip, raw)	3.71	3.51	2.64	3.71	3.39	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	14.42	14.42	14.54	14.42	14.45	0	7
(Bean, mung)	12.77	12.77	13.06	12.77	12.84	0	7
(Cowpea)	16.25	16.25	16.63	16.25	16.35	0	7
Akhrot (Walnuts)	26	26	25.44	26	25.86	0	14
Arhar dal (Red gram, split, dried, raw)	36.4	36.4	36	36.4	36.3	0	7
Chilgoza (Chilgoza pine, dried)	211	211	206	211	209.75	0	0
China badam (Peanut, raw)	21.57	21.45	20.69	21.57	21.4	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	16.1	16.1	16.18	16.1	16.12	0	7
Hizlee badam (Cashew nut, raw)	128	128	128	128	128.0	0	0
Khesari dal, vanga (Grass pea, split dried, raw)	18.05	18.05	17.42	18.05	17.89	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	14.58	14.58	14.87	14.58	14.65	0	7
Pesta (Pistachio nuts, dried)	97	97	95	97	96.5	0	0
Til (Sesame, seeds, whole, dried)	24.67	24.67	24.53	24.67	24.63	0	0
<b>Meat and offal</b>							
(Beef)	32.71	32.71	32.36	32.71	32.63	0	7

(Goat)	56	56	57.14	56	56.29	0	7
(Poultry)	33.96	33.67	30.63	33.96	33.05	0	14
Gorur mangsaw, kima (Beef, mince, lean, raw)	52.07	52.07	53.14	52.07	52.34	0	0
Fish, seafood, amphibians and invertebrates							
Any Type (Fish)			63.33		63.33	0	0
Fish, Trout (Fish, indian river shad, raw)			116.67		116.67	0	7
Mrigal, chokh soho (Fish, mrigal carp, eyes included, raw)	30	30		30	30.0	0	0
Rui, nodir (Fish, rohu, river, raw)	31.71	31.71		31.71	31.71	0	0
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	22.54	21.17	16.03	22.54	20.57	0	14
Murgir dim, farm er (Egg, chicken, farmed, raw)	19.81	18.68	13.96	19.81	18.06	0	7
Milk and milk products							
(Milk, curds)	9.58	9.5	9.17	9.58	9.46	0	0
(Milk, buffalo)	16.79	16.66	15.35	16.79	16.4	0	14
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	6	6	8	6	6.5	0	14
Vegetables and vegetable products							
(Gourd, bitter)	12	11.83	10.27	12	11.2	0	7
(Eggplant)	5.73	5.41	4.66	5.73	5.24	0	7
(Gourd, bottle)	8	6.5	5	8	5.88	0	7
(Gourd, ridge)			8		8.0	0	0
(Gourd, snake)			8		8.0	0	0
(Leaf, fenugreek)		3.5	6.08		5.71	0	7
(Onion, with stalks)		4.33	4.25		4.26	7	14
(Onion)	7.61	7.54	5.04	7.61	6.95	0	14
(Pumpkin)	11	8.38	4.61	11	7.22	0	7
Badhakopi (Cabbage, raw)	4.38	4.25	2.81	4.38	3.95	0	7
Dheros (Okra, raw)	18	8.8	5.82	18	7.17	0	7
Gajor (Carrot, raw)	4.69	4.43	3.48	4.69	4.32	0	14
Kacha pepe siddha, lobon chara (Papaya, unripe, cooked)	17.5	17.5	18	17.5	17.54	0	0
Palong shak (Spinach, raw)	5.14	4.91	3.06	5.14	4.42	0	7
Shosa (Cucumber, peeled, raw)	7.22	7.17	4.98	7.22	6.64	0	14
Fruit and fruit products							
(Apple)	9.21	8.96	6.08	9.21	8.36	0	14
(Banana, ripe)	12.95	17.06	16.8	12.95	14.94	0	14
(Coconut, dried)	30.92	30.42	25.18	30.92	29.36	0	7
(Grapes, pale green)			6.71		6.71	0	7
(Mango, ripe)			15.08		15.08	0	7
(Melon, musk, other fruits)			8.11		8.11	0	7
(Plums)			4.86		4.86	0	7
(Tomato, ripe)	10.63	9.66	5.84	10.63	9.19	7	14



Dumur, paka (Fig, ripe)			8.14		8.14	0	7
Khejur, paka, taza (Dates)	20.17	20.13	18.01	20.17	19.62	0	7
Khorma (Dates, dried)	15.88	15.75	16.32	15.88	15.96	0	7
Komola (Orange)	8.26	8.3		8.26	8.27	0	14
Nashpati (Pear, asian)	16.4	12.86	7.83	16.4	11.09	0	7
Peyara, bivinno variety, kancha (Guava, green)	9.65	9.5	7	9.65	9.53	0	7
Tarmuz, lal, paka (Watermelon, ripe)			3.73		3.73	0	7
Tetul, paka, misti (Tamarind, pulp, sweet, ripe)	20	20	20	20	20.0	0	0
<b>Oils and fats</b>							
(Oil, castor)	106.96	106.96	106.96	106.96	106.96	0	0
(Oil, linseed)	158.84	158.84	138.84	158.84	153.84	0	0
(Oil, soybean)	140.73	140.73	140.73	140.73	140.73	0	14
China badam er tel (Oil, peanut)	104.35	104.35	104.35	104.35	104.35	0	0
Dalda/Bonoshpati (Ghee, vegetable)	16.47	16.47	16.39	16.47	16.45	0	0
Ghee, gorur (Ghee, cow)	13.58	13.58	13.58	13.58	13.58	0	7
Makhon, nonta (Butter, salted)	111.76	111.76	109.13	111.76	111.11	0	14
Margarine (Margarine)	56.46	56.46	56.92	56.46	56.58	0	7
Sorishar tel (Oil, mustard)	16.79	16.79	16.67	16.79	16.76	0	7
Tiler tel (Oil, sesame)	235.51	235.51	235.51	235.51	235.51	0	0
<b>Sugars and confectionary</b>							
(Biscuits, salty)	25.61	25.61	25.61	25.61	25.61	0	7
(Sugar, brown)	10.59	10.59	10.45	10.59	10.56	0	0
(Sugarcane)	10	10	9.67	10	9.93	0	0
(Sweets)	12.13	12.13	11.79	12.13	12.04	0	7
Chini, sada (Sugar, white)	7.93	7.93	7.98	7.93	7.94	0	14
Cookes (Packet/Brand) (Cookies)	33.14	33.14	33.14	33.14	33.14	0	7
Cookies (Bakery) (Cookies (Bakery))	27.13	27.13	26.81	27.13	27.05	0	7
Gur, Akh (Jaggery, sugarcane, solid)	18.5	18.5	18.33	18.5	18.46	0	0
Modhu (Honey)	94.67	94.67	95.78	94.67	94.94	0	7
<b>Herbs, spices and condiments</b>							
Ada (Ginger root, raw)	28.75	28.83	25.52	28.75	27.96	0	14
Baking powder (Baking powder)	51.89	51.89	51.89	51.89	51.89	0	7
Darchini gura (Cinnamon, ground)	34	34	34	34	34.0	0	7
Dhone pata (Coriander leaf, raw)	10	7	5.9	10	6.58	0	14
Elach (Cardamom, seeds)	106.35	105.88	105.55	106.35	106.04	0	7
Golmorich (Pepper, black)	62.87	62.87	69.42	62.87	64.51	0	14
Holud (Turmeric, dried)	32	32	33.92	32	32.48	0	14
Jira (Cumin, seeds)	48.29	48.29	48.29	48.29	48.29	0	7
Kancha morich (Chilli, green, with seeds, raw)	21.82	19.61	10.44	21.82	18.26	0	14
Labongo (Cloves, dried)	196	196	195	196	195.75	0	7
Lebu, Kagoji (Lemon, kagoji)	21.56	20.32	13.84	21.56	19.04	0	7
Lobon (Salt)	3.91	3.91	3.88	3.91	3.9	7	14

Mauri (Fennel, seeds)	28	28	28	28	28.0	0	0
Pudina pata (Spearment leaf, raw)		4.5	5.55		5.38	0	14
Rosun (Garlic, raw)	22.5	21.25	20.13	22.5	21.6	0	14
Sarisha (Mustard, seeds)	81.83	81.83	81.37	81.83	81.72	0	0
Shukna morich (Chilli, red, dry)	27.58	27.08	26.33	27.58	27.15	0	7
Tejpata (Bay leaf, dried)	42	42	42	42	42.0	0	0
<b>Beverages</b>							
Cha pata (Tea, powder)	77.09	77.01	77.01	77.09	77.05	7	14
Coffee (Coffee, powder)	100	100	100	100	100.0	0	0
Green Tea (Herb, tea, shih)	104.01	104.01	102.76	104.01	103.7	0	14
Komol paniyo (Beverage, carbonated)	12.47	12.47	12.47	12.47	12.47	0	7

**Annex I.16. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Khyber Agency Agriculture Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Maize, grain or flour, local)	5.17	4.47	4.1	5.17	4.73	0	7
(Millet, pearl, local)	4.92	4.7	4.53	4.92	4.77	0	0
(Sorghum, grain or flour, local)	4.83	4.33	4.17	4.83	4.54	0	7
(Vermicelli)	4.46	4.46	4.5	4.46	4.47	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	11.08	11.02	10.76	11.08	10.98	7	14
Bhutta, shukna (Maize, yellow, dried, raw)	4.34	3.9	3.57	4.34	4.04	0	7
Jowar (Sorghum, raw)	4.33	4	3.84	4.33	4.13	0	7
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	13.83	13.4	12.93	13.83	13.5	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	5.22	4.68	4.4	5.22	4.88	0	7
Rice (Toota Chawal) (Rice, grain or flour)	5	5	4.17	5	4.79	0	7
Sooji, gom (Semolina, wheat, raw)	8.05	8.29	8.43	8.05	8.2	0	7
Wheat flour white (Wheat, flour, white, refined)	4.19	4.14	4.1	4.19	4.16	0	7
Wheat, flour, brown, whole (Wheat, whole, raw)	4.2	4.1	4.1	4.2	4.15	0	0
<b>Roots and tubers</b>							
(Horseradish)	10.05	5.45		10.05	9.26	0	14
(Potato)	4.37	4.24	4.62	4.37	4.4	0	14
Bon Alu, bivinno projati (Yam, raw)	4.57	4.2	3.91	4.57	4.31	0	7
Shalgom (Turnip, raw)	3.99	4.02	4.58	3.99	4.05	0	7

Legumes, nuts and seeds							
(Bean, kidney)	13.44	13.3	12.99	13.44	13.29	0	14
(Bean, mung)	13.5	13.12	12.84	13.5	13.24	0	7
(Cowpea)	20.83	20.83	18.33	20.83	20.2	0	7
Akhrot (Walnuts)	25	25	26.67	25	25.42	0	7
China badam (Peanut, raw)	36.32	36.49	34.27	36.32	35.85	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	17.22	17.61	17	17.22	17.26	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	15	16.67	16.67	15	15.84	0	7
Maskalai dal, vanga (Black gram, split, dried, raw)	10.83	11.25	12.09	11.66	11.46	0	7
Meat and offal							
(Beef)	31.67	31.67	32	31.67	31.75	0	7
(Goat)	70.41	70.41	72.91	70.41	71.04	0	7
(Poultry)	46.1	42.4	41.5	46.1	44.02	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	32.29	31.88	32.5	32.29	32.24	0	7
Fish, seafood, amphibians and invertebrates							
Any Type (Fish)	22	22.5	20	22	21.63	0	7
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	23.4	23.4	23.4	23.4	23.4	0	14
Murgir dim, farm er (Egg, chicken, farmed, raw)	16.43	16.94	17.6	16.43	16.84	0	7
Milk and milk products							
(Milk, curds)	9.71	10.15	10.74	9.71	10.08	0	0
(Milk, buffalo)	9.9	9.79	9.27	9.9	9.71	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	9.58	9.45	9.59	9.58	9.55	0	7
Vegetables and vegetable products							
(Gourd, bitter)		4.17	5.24		4.81	0	0
(Eggplant)	7.84	5.76	5.55	7.95	6.78	0	7
(Gourd, bottle)	5.51	4.46	4.15	5.55	4.89	0	7
(Gourd, ridge)		3.99	5.29		4.76	0	7
(Onion, with stalks)	10.16	8.4	31.25	10.16	10.24	7	14
(Onion)	5.07	4.2	3.93	5.07	4.57	0	14
(Pumpkin)	7.78	6.55	5.76	7.78	6.89	0	7
Badhakopi (Cabbage, raw)	8.59	8.25	4.58	8.59	8.39	0	7
Dheros (Okra, raw)	16.67	5	5.98	11.67	6.35	0	7
Gajor (Carrot, raw)	4.64	4.67	5.42	4.64	4.67	0	7
Palong shak (Spinach, raw)	1.57	1.34		1.57	1.53	0	7
Shosa (Cucumber, peeled, raw)	5	4.59	4.36	5	4.74	0	14
Fruit and fruit products							
(Apple)	12.01	11.68	11.54	12.01	11.81	0	7
(Banana, ripe)	4.75	4.09	3.63	4.75	4.3	0	7
(Grapes, pale green)		8.03	9.53		8.92	0	7

(Mango, ripe)		7.52	8.88		8.36	0	7
(Melon, musk, other fruits)		3.33	4.17		3.96	0	7
(Tomato, ripe)	4.68	4	3.53	4.59	4.18	0	14
Khejur, paka, taza (Dates)	43.33	40	33.33	43.33	40.0	0	7
Khorma (Dates, dried)	16.67	13.33	13.33	16.67	15.0	0	7
Komola (Orange)	5.14	3.44	3.75	5.14	4.77	0	14
Nashpati (Pear, asian)	10.83	10.83	10	10.83	10.62	0	7
Peyara, bivinno variety, kancha (Guava, green)	5.88	5.27	4.96	5.88	5.5	0	7
Tarmuz, lal, paka (Watermelon, ripe)		2.53	2.54		2.54	0	7
<b>Oils and fats</b>							
Dalda/Bonoshpati (Ghee, vegetable)	10	10	10.83	10	10.21	0	0
Ghee, gorur (Ghee, cow)	14.88	10.59	10.69	10.64	11.7	7	14
Sorishar tel (Oil, mustard)	22	22.83	24.5	22	22.83	0	7
<b>Sugars and confectionary</b>							
(Biscuits, salty)	20	20	21	20	20.25	0	7
(Sweets)	15.61	19.08	19.22	18.11	18.01	0	7
Chini, sada (Sugar, white)	6.18	7.4	7.08	6.18	6.71	7	14
Cookes (Packet/Brand) (Cookies)	23.15	26.48	23.15	23.15	23.98	0	7
Cookies (Bakery) (Cookies (Bakery))	17.86	17.86	18.98	17.86	18.14	0	7
Gur, Akh (Jaggery, sugarcane, solid)	7.28	8.77	9.42	7.28	8.19	0	7
<b>Herbs, spices and condiments</b>							
Ada (Ginger root, raw)	35.63	35.47	34.12	35.63	35.21	0	14
Baking powder (Baking powder)	9.31	7.09	7.09	6.81	7.57	0	14
Dhone pata (Coriander leaf, raw)	21.67	21.82	21.59	21.67	21.69	0	14
Elach (Cardamom, seeds)	273.33	297.22	318.89	273.33	290.69	0	14
Golmorich (Pepper, black)	106.29	108.35	109.4	106.29	107.58	0	14
Jira (Cumin, seeds)	121.48	121.3	117.59	121.48	120.46	0	14
Kancha morich (Chilli, green, with seeds, raw)	45.44	43.55	39.17	45.44	43.4	7	14
Lebu, Kagoji (Lemon, kagoji)	20.79	17.94	16.51	20.79	19.01	0	14
Lobon (Salt)	5.03	5.03	5.03	5.03	5.03	7	14
Pudina pata (Spearmint leaf, raw)	14.03	17.79	20.18	14.03	16.51	0	14
Rosun (Garlic, raw)	17.67	17.49	19.96	17.74	18.21	0	14
Shukna morich (Chilli, red, dry)	44.16	43.96	44.38	44.16	44.17	0	14
<b>Beverages</b>							
Cha pata (Tea, powder)	58.06	57.36	56.39	58.06	57.47	0	14
Coffee (Coffee, powder)	212.22	211.11	211.11	212.22	211.66	0	0
Green Tea (Herb, tea, shih)	53.81	53.01	52.22	53.81	53.21	0	14
<b>Composite dishes</b>							
Dheros-tomato bhuna (Okra and tomato bhuna)	24	24	28	24	25.0	0	7
Khichuri (Khichuri, plain)	57.14	57.14	57.14	57.14	57.14	0	7

**Annex I.17. List of foods found in the markets, the price per 100g, and the Minimum and Maximum Food Frequency constraints in Khyber Agency Paid/Unpaid Livelihood Zone**

Food Type	Average Price Per 100g					Food Frequency Constraints	
	Winter	Spring	Summer	Autumn	Annual Average	Min	Max
<b>Grains and grain-based products</b>							
(Bread, white)	7.93	7.93	7.93	7.93	7.93	0	7
(Maize, grain or flour, local)	5	4.93	4.27	5	4.8	0	7
(Millet, pearl, local)	4.88	4.88	4.57	4.88	4.8	0	0
(Sorghum, grain or flour, local)	4.58	4.58	4	4.58	4.44	0	7
(Vermicelli)	6.82	6.82	6.82	6.82	6.82	0	7
(Wheat, flour, maida)	36.25	36.25	36.25	36.25	36.25	0	7
Ata, lal whole grain ata (Wheat, flour, brown, wholegrain, raw)	3.89	3.89	3.77	3.89	3.86	0	14
Bhutta, shukna (Maize, yellow, dried, raw)	4.12	4.12	3.59	4.12	3.99	0	7
Jowar (Sorghum, raw)	3.68	3.54	3.26	3.68	3.54	0	7
Rice (Banaspati) (Rice, white, sunned, aromatic, raw)	13.59	13.53	12.56	13.59	13.32	0	7
Rice (Motta Brown Chawal) (Rice, brown, parboiled, home pounded, raw)	5.16	5.09	4.59	5.16	5.0	0	7
Rice (Toota Chawal) (Rice, grain or flour)	5.83	5.83	5.55	5.83	5.76	0	7
Sooji, gom (Semolina, wheat, raw)	7.45	7.53	7.45	7.45	7.47	0	7
Wheat flour white (Wheat, flour, white, refined)	9.32	9.31	9.01	9.32	9.24	0	7
<b>Roots and tubers</b>							
(Horseradish)	6.61	6.71	5.99	6.61	6.61	0	14
(Potato)	4.49	4.53	4.13	4.49	4.41	0	14
Bon Alu, bivinno projati (Yam, raw)	4.75	4.79	4.56	4.75	4.71	0	7
Shalgom (Turnip, raw)	3.5	3.51	4.89	3.5	3.58	0	7
<b>Legumes, nuts and seeds</b>							
(Bean, kidney)	12.15	12.1	12.01	12.15	12.1	0	14
(Bean, mung)	13.22	13.15	12.84	13.22	13.11	0	7
(Cowpea)	16.39	16.39	16.39	16.39	16.39	0	7
Akhrot (Walnuts)	29.67	29.67	29.13	29.67	29.53	0	7
China badam (Peanut, raw)	21.46	21.17	20.58	21.46	21.17	0	14
Chola, shukna (Bengal gram, whole, dried, raw)	19.82	19.82	19.84	19.82	19.83	0	7
Khesari dal, vanga (Grass pea, split dried, raw)	21.71	21.71	12.2	21.71	20.88	0	7
<b>Meat and offal</b>							
(Beef)	31.22	31.22	31.29	31.22	31.23	0	7
(Goat)	75	75	75	75	75.0	0	7
(Poultry)	15.23	15.23	14.13	15.23	14.95	0	7
Gorur mangsaw, kima (Beef, mince, lean, raw)	32.64	32.64	32.79	32.64	32.67	0	7
<b>Fish, seafood, amphibians and invertebrates</b>							

Any Type (Fish)	29.03	29.03	28.57	29.03	28.92	0	7
Fish, Mahseer (Fish, carp, raw)	23	23	20	23	22.25	0	0
Rui, nodir (Fish, rohu, river, raw)	20	20	20	20	20.0	0	0
Eggs and egg products							
Deshi murgir dim siddha, lobon chara (Egg, chicken, native, cooked)	24.42	24.42	23.82	24.42	24.27	0	7
Murgir dim, farm er (Egg, chicken, farmed, raw)	16.37	16.37	17.09	16.37	16.55	0	7
Milk and milk products							
(Milk, curds)	9.85	9.99	10.79	9.85	10.12	0	0
(Milk, buffalo)	9.94	10	10.2	9.94	10.02	0	7
Gorur dudh, purno noni soho (Milk, cow, whole fat, pasteurised, UHT)	9.41	9.46	9.7	9.41	9.49	0	7
Vegetables and vegetable products							
(Gourd, bitter)	4.17	4.72	5.11	4.17	4.99	0	7
(Eggplant)	4.96	4.85	4.11	4.96	4.71	0	7
(Gourd, bottle)	5.61	5.45	4.36	5.61	5.25	0	7
(Gourd, ridge)	4.17	3.75	4.34	4.17	4.28	0	7
(Mango, green)		10	10	10	10.0	0	0
(Onion, with stalks)	12.32	12.53	15.53	12.32	12.65	0	14
(Onion)	5.2	5.1	4.61	5.2	5.03	0	7
(Pumpkin)	5.53	5.53	4.35	5.53	5.2	0	7
Badhakopi (Cabbage, raw)	4.99	4.99	5.83	4.99	5.03	0	7
Dheros (Okra, raw)		6.11	6.38	6.67	6.36	0	7
Gajor (Carrot, raw)	3.93	4.07		4	4.0	0	7
Palong shak (Spinach, raw)	2.67	2.71	3.59	2.67	2.71	0	7
Shosa (Cucumber, peeled, raw)	4.92	4.75	4.23	4.92	4.71	0	14
Fruit and fruit products							
(Apple)	11.36	11.46	11.05	11.36	11.31	0	7
(Banana, ripe)	5.14	5.08	4.17	5.14	4.88	0	7
(Grapes, pale green)	9.16	9.16	9.19	9.16	9.18	0	7
(Mango, ripe)	10	8.89	9.45	10	9.47	0	7
(Melon, musk, other fruits)	10	10	5.42	10	7.38	0	7
(Tomato, ripe)	4.58	4.47	3.59	4.58	4.3	0	14
Khejur, paka, taza (Dates)	40	40	40	40	40.0	0	7
Khorma (Dates, dried)	13.33	13.33	10	13.33	12.5	0	7
Komola (Orange)	4.49	4.58	5.67	4.51	4.56	0	7
Nashpati (Pear, asian)	11.5	11.08	10.87	11.5	11.24	0	7
Peyara, bivinno variety, kancha (Guava, green)	6.68	6.54	5.73	6.68	6.41	0	7
Tarmuz, lal, paka (Watermelon, ripe)			2.21		2.21	0	7
Oils and fats							
Dalda/Bonoshpati (Ghee, vegetable)	14.8	14.8	14.8	14.8	14.8	0	0
Ghee, gorur (Ghee, cow)	11.23	11.23	11.21	11.23	11.23	0	14
Sorishar tel (Oil, mustard)	20.38	20.67	22.24	20.38	20.92	0	7
Sugars and confectionary							

(Biscuits, salty)	17.09	17.09	17.09	17.09	17.09	0	7
(Sweets)	17.91	17.91	18.82	17.91	18.14	0	7
Chini, sada (Sugar, white)	5.34	5.34	6.26	5.34	5.57	0	14
Cookes (Packet/Brand) (Cookies)	17.25	17.25	17.36	17.25	17.28	0	7
Cookies (Bakery) (Cookies (Bakery))	18.33	18.33	18.19	18.33	18.3	0	7
Gur, Akh (Jaggery, sugarcane, solid)	8.33	8.47	10.46	8.38	8.91	0	7
Modhu (Honey)	120	120	120	120	120.0	0	7
Herbs, spices and condiments							
Ada (Ginger root, raw)	25.12	25.12	24.78	25.12	25.04	0	7
Baking powder (Baking powder)	12.78	12.78	12.57	12.78	12.73	0	14
Dhone pata (Coriander leaf, raw)	33.52	33.52	33.11	33.52	33.42	0	14
Elach (Cardamom, seeds)	287.08	287.08	313.96	287.08	293.8	0	14
Golmorich (Pepper, black)	117.33	117.33	115.5	117.33	116.87	0	14
Holud (Turmeric, dried)	140	140	136	140	139.0	0	7
Jira (Cumin, seeds)	107.87	107.87	119.3	107.87	110.72	0	7
Kancha morich (Chilli, green, with seeds, raw)	17.22	17.22	15.35	17.22	16.75	0	14
Lebu, Kagoji (Lemon, kagoji)	24.02	24.02	22.61	24.02	23.67	0	7
Lobon (Salt)	2.74	2.74	2.78	2.74	2.75	7	14
Mauri (Fennel, seeds)	20	20	20	20	20.0	0	7
Pudina pata (Spearment leaf, raw)	17	17	18.41	17	17.35	0	14
Rosun (Garlic, raw)	20.6	20.6	20.29	20.6	20.52	0	14
Shukna morich (Chilli, red, dry)	59.82	59.82	62.1	59.82	60.39	0	14
Beverages							
Cha pata (Tea, powder)	56.86	56.86	55.67	56.86	56.56	7	14
Green Tea (Herb, tea, shih)	52.48	52.48	52.28	52.48	52.43	0	14
Komol paniyo (Beverage, carbonated)	11.66	11.66	11.66	11.66	11.66	0	7



Annex 2.1. The daily lowest cost diet for the CotD family that meets only a household's energy requirements.

1. The daily lowest cost diet for the CotD family in Charsadda district that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

<b>Age Group</b>	<b>Season 1 Winter</b>	<b>Season 2 Spring</b>	<b>Season 3 Sum- mer</b>	<b>Season 4 Autumn</b>	<b>Annual Cost</b>
12-23 months old	3.68	3.68	3.68	3.68	1300.00
Rest of family	90.64	90.64	90.64	90.64	33,100.00
Overall	94.32	94.32	94.32	94.32	34,400.00

2. The daily lowest cost diet for the CotD family in Tank district Agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

<b>Age Group</b>	<b>Season 1 Winter</b>	<b>Season 2 Spring</b>	<b>Season 3 Sum- mer</b>	<b>Season 4 Autumn</b>	<b>Annual Cost</b>
12-23 months old	5.51	5.52	5.36	5.52	2000.00
Rest of family	137.24	137.79	134.76	137.52	49800.00
Overall	142.76	143.31	140.13	143.05	51800.00

3. The daily lowest cost diet for the CotD family in Tank district Livestock/Poultry livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

<b>Age Group</b>	<b>Season 1 Winter</b>	<b>Season 2 Spring</b>	<b>Season 3 Sum- mer</b>	<b>Season 4 Autumn</b>	<b>Annual Cost</b>
12-23 months old	5.64	5.59	5.56	5.64	2000.00
Rest of family	141.14	140.44	139.37	141.14	51200.00
Overall	146.78	146.03	144.93	146.78	53300.00

4. The daily lowest cost diet for the CotD family in Islamabad that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

<b>Age Group</b>	<b>Season 1 Winter</b>	<b>Season 2 Spring</b>	<b>Season 3 Sum- mer</b>	<b>Season 4 Autumn</b>	<b>Annual Cost</b>
12-23 months old	6.46	6.46	6.46	6.43	2,400.00
Rest of family	165.56	165.56	165.56	165.01	60,400.00
Overall	172.02	172.02	172.02	171.44	62,800.00

5. The daily lowest cost diet for the CotD family in Faisalabad district that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	4.85	4.69	4.72	4.85	1700.00
Rest of family	124.94	119.52	120.07	124.94	44500.00
Overall	129.79	124.21	124.79	129.79	46200.00

6. The daily lowest cost diet for the CotD family in Rajanpur district agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	3.27	2.75	2.94	2.75	1100.00
Rest of family	80.48	67.81	72.52	67.81	26700.00
Overall	83.76	70.55	75.46	70.55	27800.00

7. The daily lowest cost diet for the CotD family in Haveli district agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	6.05	6.05	6.05	6.05	2200.00
Rest of family	150.31	150.31	150.31	150.31	54900.00
Overall	156.36	156.36	156.36	156.36	57100.00

8. The daily lowest cost diet for the CotD family in Haveli district Livestock/Poultry livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	5.7	5.7	5.7	5.7	2100.00
Rest of family	142.51	142.51	142.51	142.51	52000.00
Overall	148.21	148.21	148.21	148.21	54100.00

9. The daily lowest cost diet for the CotD family in Loralai district agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	4.21	4.21	4.21	4.21	1500.00
Rest of family	103.92	106.24	105.37	106.33	38500.00
Overall	108.14	110.46	109.59	110.54	40000.00

10. The daily lowest cost diet for the CotD family in Naseerabad district agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	5.91	5.91	5.91	5.91	2200.00
Rest of family	150.29	150.44	150	150.29	54800.00
Overall	156.21	156.35	155.91	156.21	57000.00

11. The daily lowest cost diet for the CotD family in Jacobabad district agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	5.06	5.44	5.13	5.06	1900.00
Rest of family	136	143.28	138.22	135.88	50300.00
Overall	141.06	148.72	143.34	140.95	52200.00

12. The daily lowest cost diet for the CotD family in Sanghar district Agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	6.45	6.39	6.42	6.57	2400.00
Rest of family	168.28	167.18	167.74	170.21	61400.00
Overall	174.74	173.57	174.15	176.78	63700.00

13. The daily lowest cost diet for the CotD family in Sanghar district Livestock/Poultry livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	7.32	7.32	7.16	7.32	2600.00
Rest of family	180.42	180.42	177.67	180.42	65400.00
Overall	187.74	187.74	184.83	187.74	68100.00

14. The daily lowest cost diet for the CotD family in Gilgit district agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	2.5	2.5	2.5	2.5	900.00
Rest of family	84.79	84.79	84.79	84.79	30900.00
Overall	87.29	87.29	87.29	87.29	31900.00

15. The daily lowest cost diet for the CotD family in Gilgit district Livestock/Poultry livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	2.5	2.5	2.5	2.5	900.00
Rest of family	68.6	68.6	68.6	68.6	25000.00
Overall	71.1	71.1	71.1	71.1	26000.00

16. The daily lowest cost diet for the CotD family in Khyber Agency district Agriculture livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

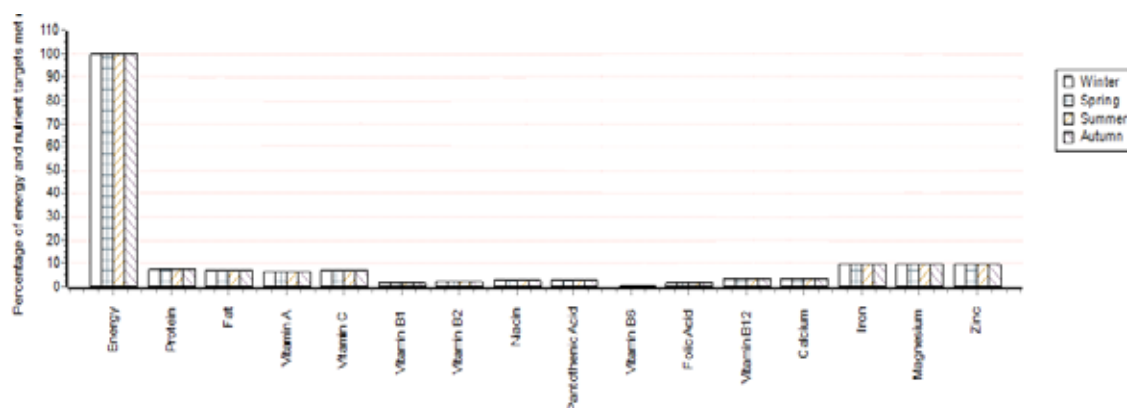
	Season 1	Season 2	Season 3	Season 4	
Age Group	Winter	Spring	Summer	Autumn	Annual Cost
12-23 months old	5.78	6.28	5.82	6.28	2200.00
Rest of family	147.81	155.16	144.9	155.16	54500.00
Overall	153.58	161.44	150.72	161.44	56700.00

17. The daily lowest cost diet for the CotD family in Khyber Agency district Paid/Unpaid livelihood zone that meets only a household's energy requirements. The annual costs have been rounded to the nearest 100 PKR.

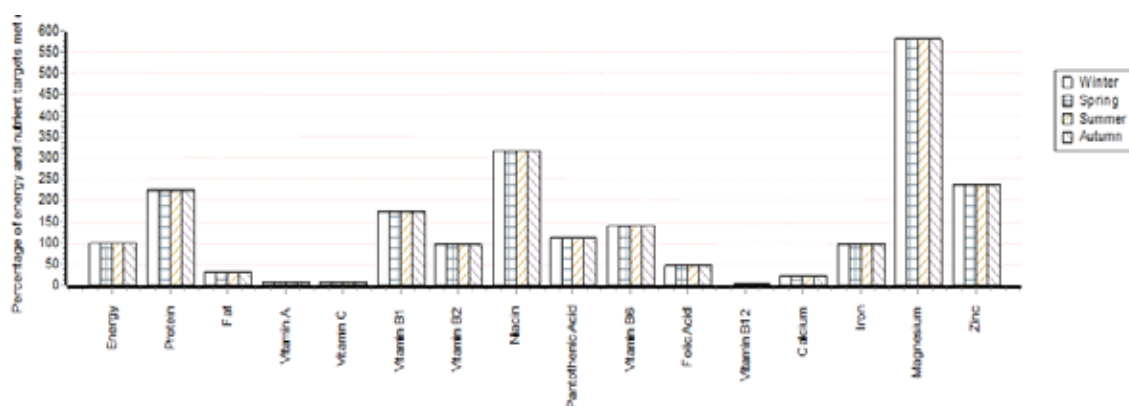
Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
12-23 months old	5.9	5.67	5.22	5.9	2100.00
Rest of family	148.96	144.76	132.36	148.96	52100.00
Overall	154.86	150.42	137.57	154.86	54100.00

Annex 2.2: The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in the livestock/poultry livelihood zone

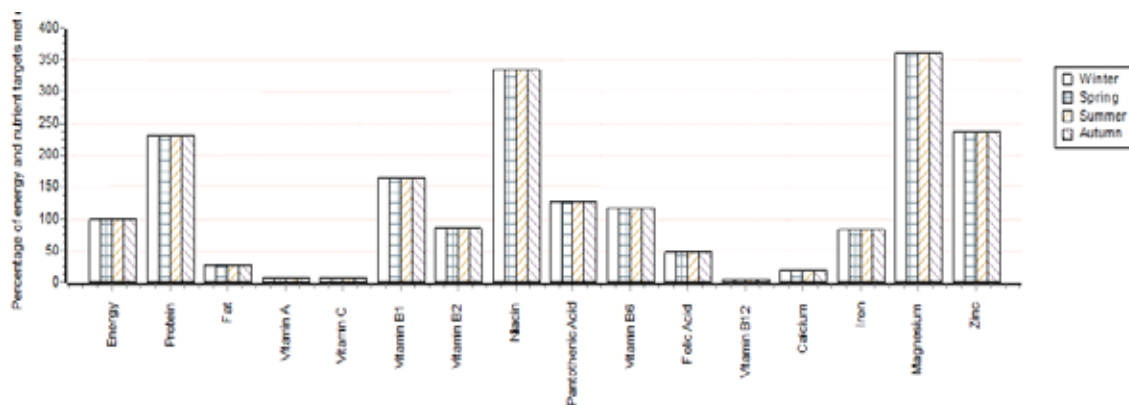
1. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in the livestock/poultry livelihood zone of Charsadda district



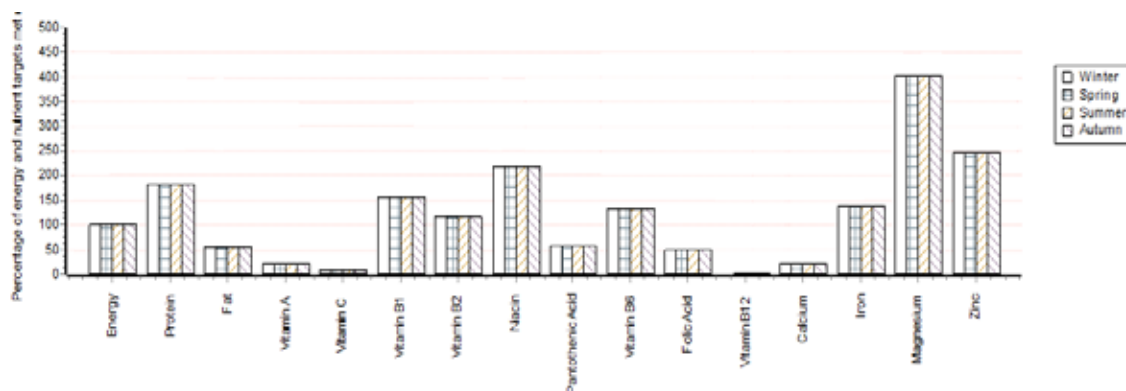
2. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in the agriculture livelihood zone of Tank district



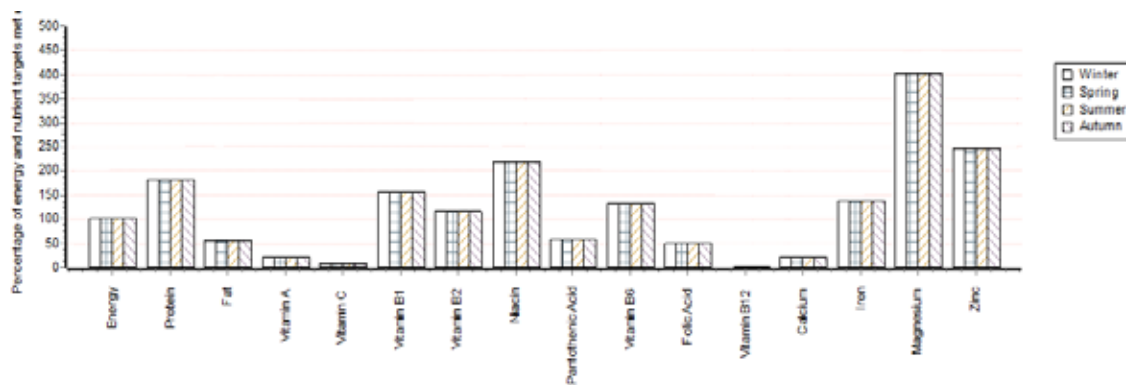
3. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in the Livestock/Poultry livelihood zone of Tank district



4. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in the urban paid/unpaid livelihood zone of Islamabad



5. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Faisalabad agriculture livelihood zone of Rajanpur district





6. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Rajanpur agriculture livelihood zone

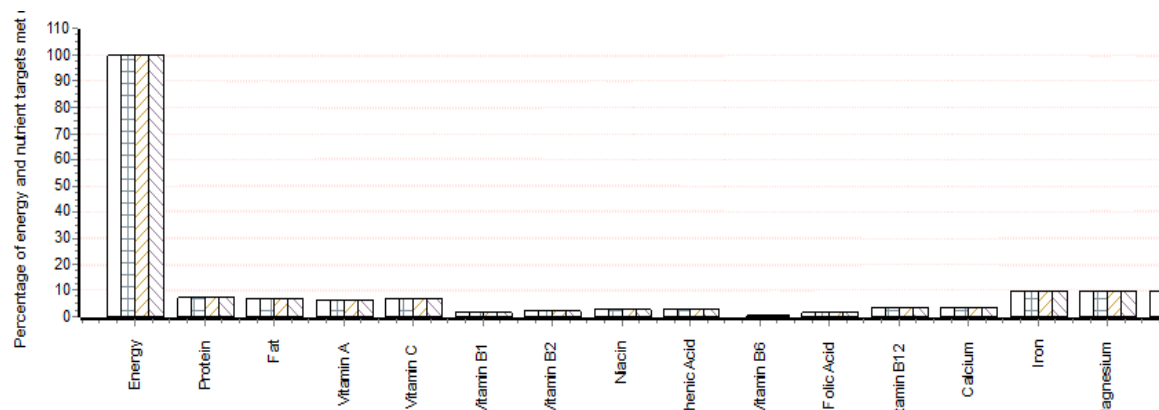
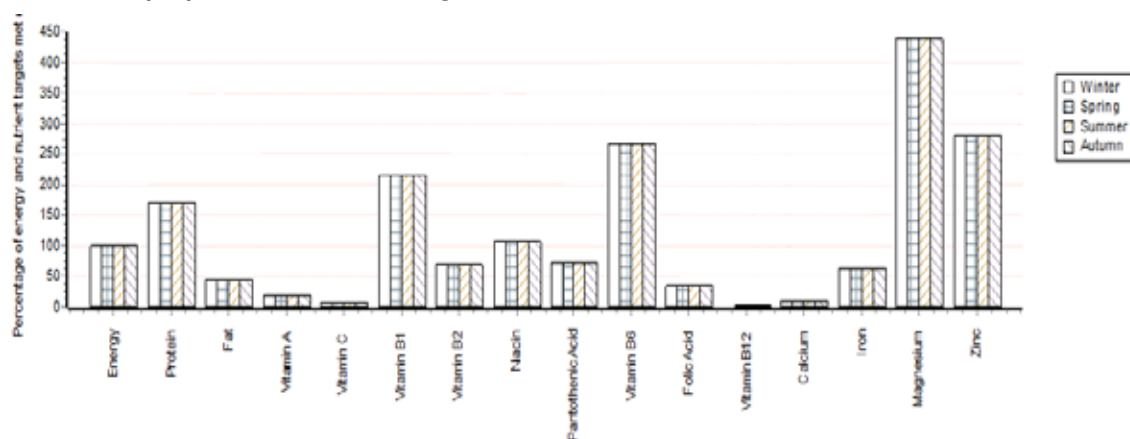
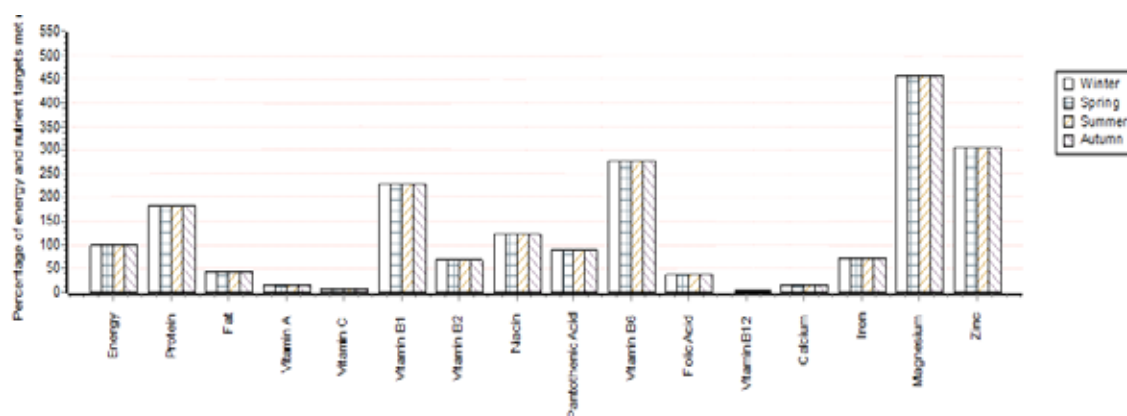


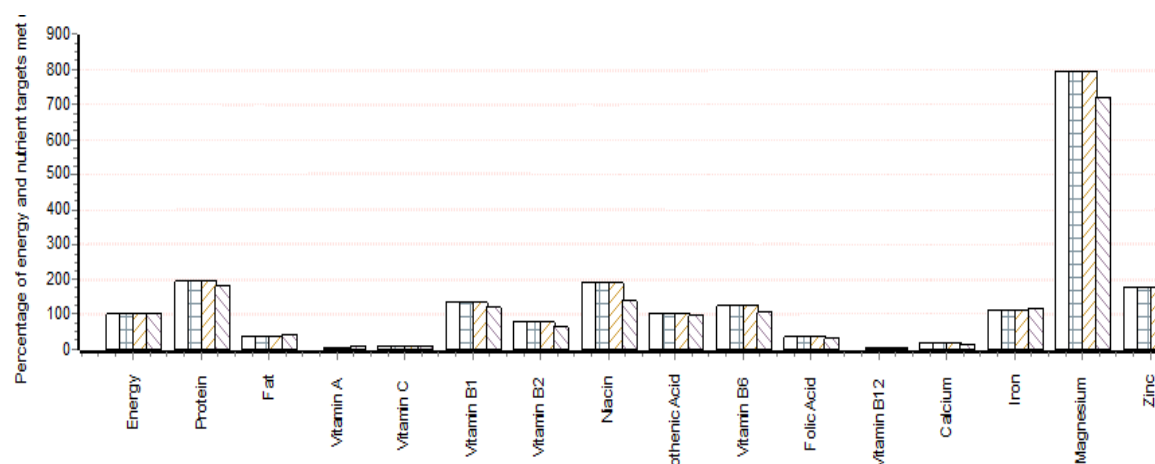
Fig 7. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Haveli agriculture livelihood zone



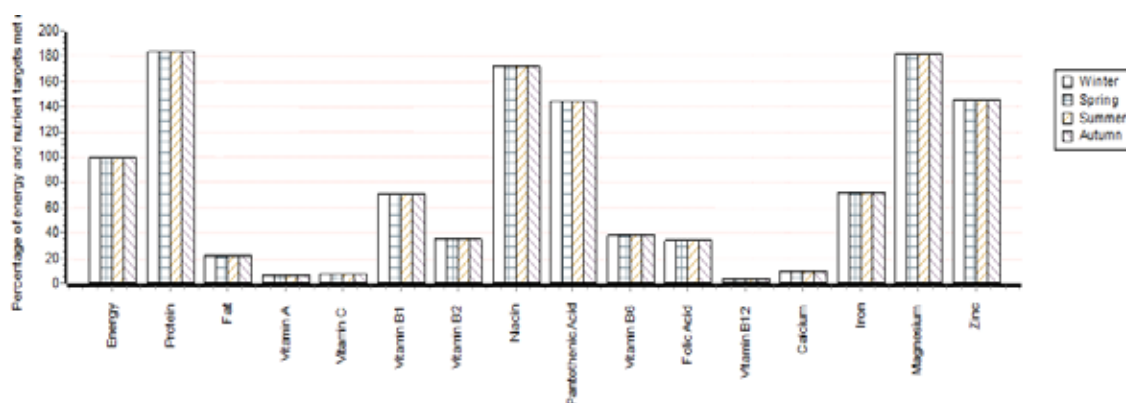
8. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Haveli Livestock/Poultry livelihood zone



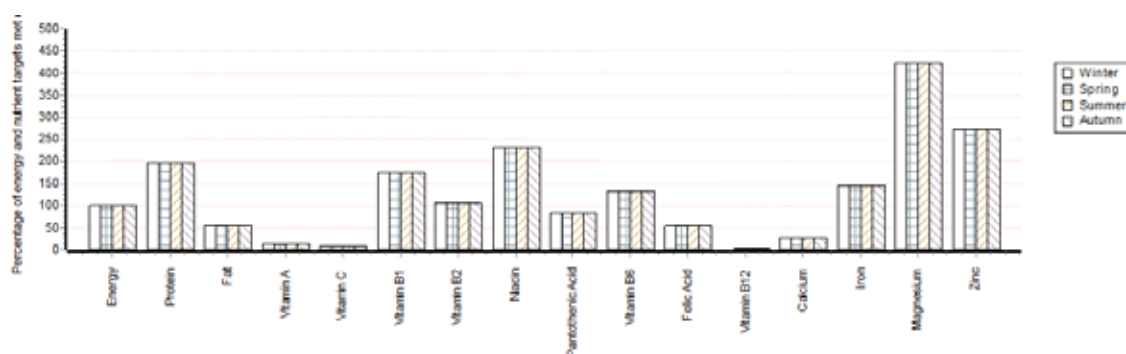
9. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Loralai agriculture livelihood zone



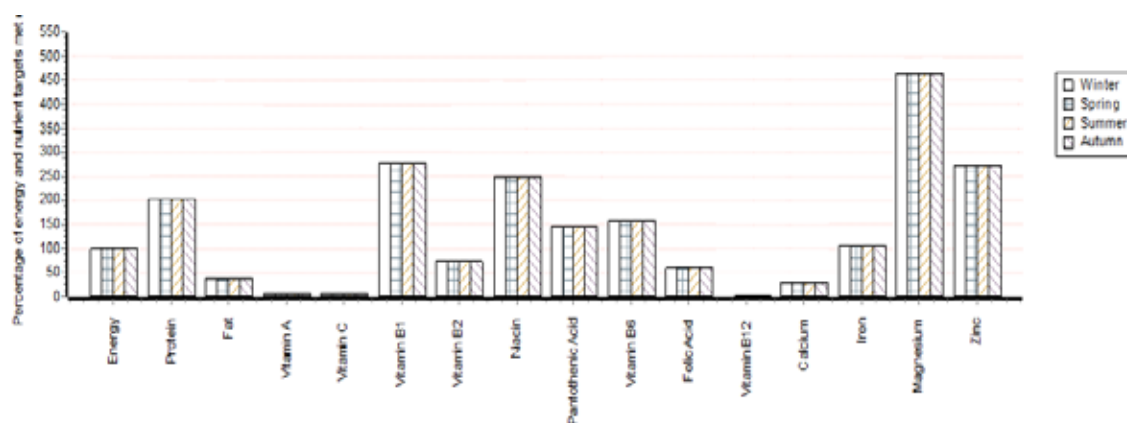
10. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Naseerabad agriculture livelihood zone



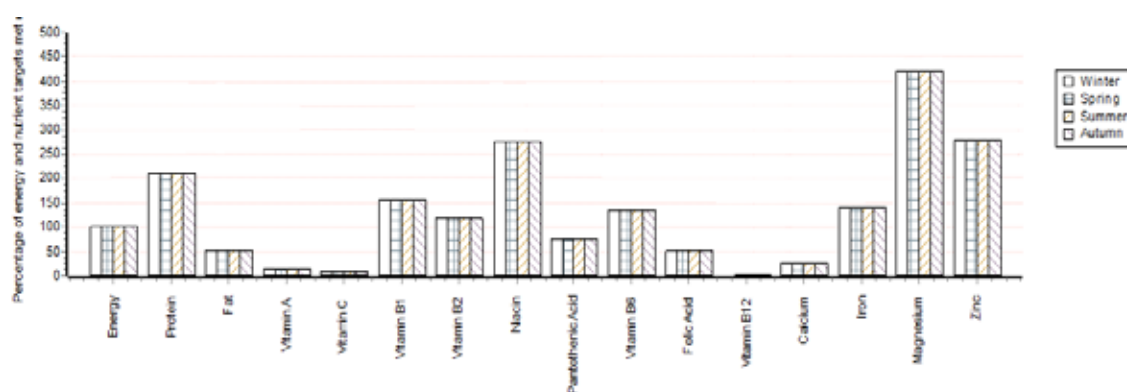
11. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Jacobabad agriculture livelihood zone



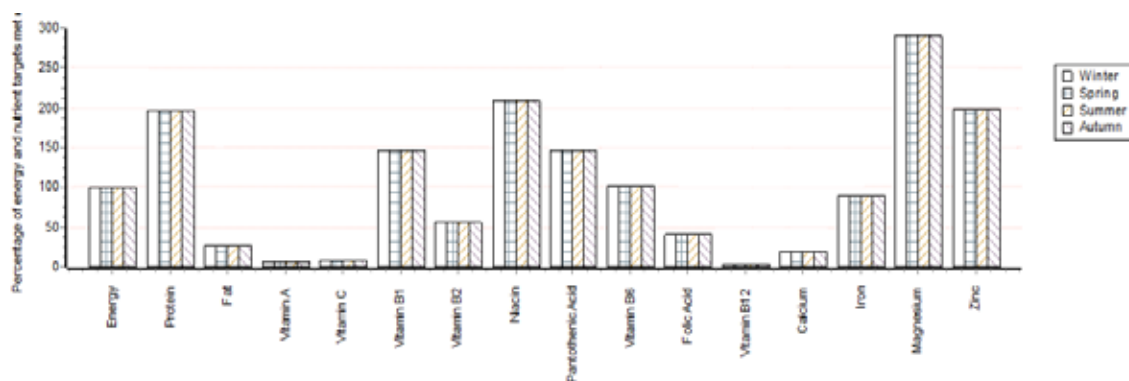
12. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Sanghar Agriculture livelihood zone



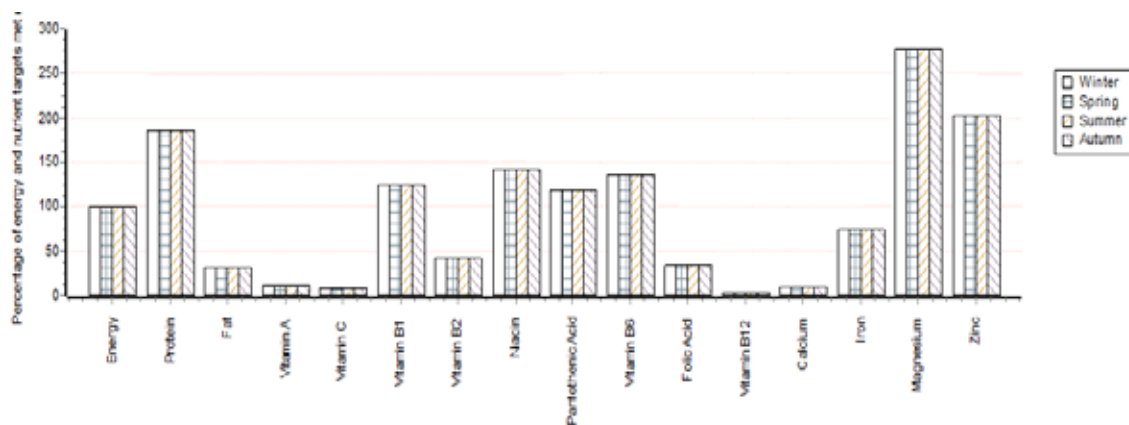
13. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Sanghar Livestock/Poultry livelihood zone



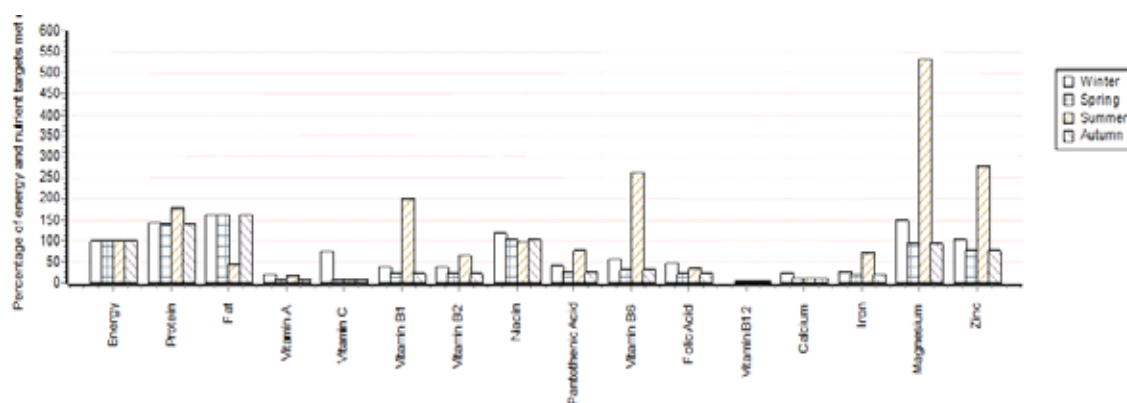
14. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Gilgit agriculture livelihood zone



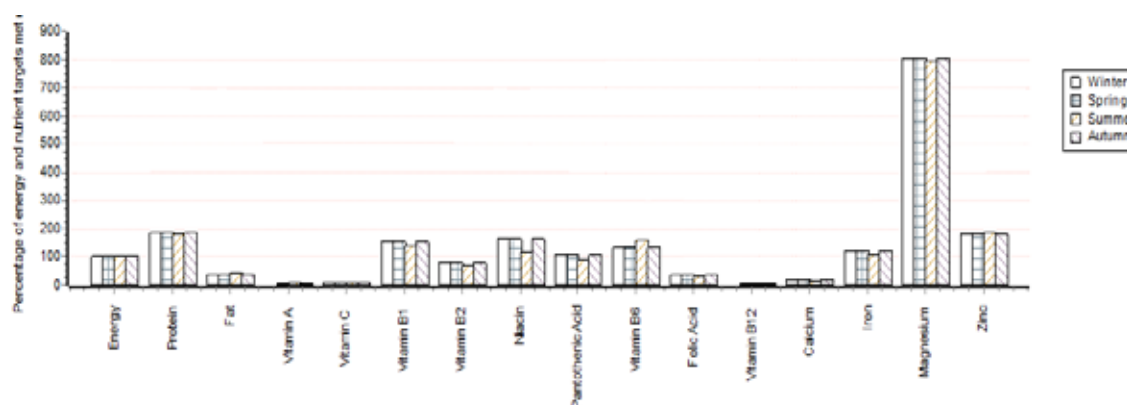
15. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Gilgit Livestock/Poultry livelihood zone



16. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Khyber Agency Agriculture livelihood zone



17. The percentage of energy and target nutrient intakes met in an energy only diet for the family, by season in Khyber Agency Paid/Unpaid livelihood zone



Annex 2.3. The daily lowest cost diet for the CotD family that meets needs for energy and micronutrient but does not consider the typical dietary habits.

1. The daily lowest cost diet for the CotD family in Charsadda that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	12.99	12.98	12.91	12.88	4700.00
A child (either sex), aged 8-9 years	37.09	37.62	37.61	37.11	13600.00
A child (either sex), aged 10-11 years	48.92	49.54	49.5	48.84	18000.00
A child (either sex), aged 12-13 years	50.74	51.31	51.29	50.7	18600.00
An adult man, aged 30-59y, 50 kg, moderately active	51.94	52.57	52.56	52.04	19100.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	76.94	77.97	77.72	76.91	28300.00
An adult woman, aged >60y, moderately active	46.4	47.2	47.19	46.39	17100.00
<b>Overall</b>	<b>325.03</b>	<b>329.18</b>	<b>328.78</b>	<b>324.87</b>	<b>119,400.00</b>

2. The daily lowest cost diet for the CotD family in Tank Agricultural livelihood zone that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	11.68	11.66	11.63	11.84	4300.00
A child (either sex), aged 8-9 years	37.48	37.49	36.55	37.92	13600.00
A child (either sex), aged 10-11 years	49.79	49.77	49.12	50.45	18100.00
A child (either sex), aged 12-13 years	52.67	52.68	51.44	53.18	19100.00
An adult man, aged 30-59y, 50 kg, moderately active	53.03	53.07	51.49	53.47	19100.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	68.61	68.57	68.23	71.01	25100.00
An adult woman, aged >60y, moderately active	48.27	48.3	47.1	48.86	17500.00
<b>Overall</b>	<b>321.53</b>	<b>321.54</b>	<b>315.57</b>	<b>326.74</b>	<b>116700.00</b>



3. The daily lowest cost diet for the CotD family in Tank Livestock/Poultry livelihood zone that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	11.65	11.67	11.73	11.98	4300.00
A child (either sex), aged 8-9 years	36.28	36.35	36.41	37.57	13300.00
A child (either sex), aged 10-11 years	48.01	48.15	48.34	49.6	17700.00
A child (either sex), aged 12-13 years	50.95	51.08	51.2	52.52	18700.00
An adult man, aged 30-59y, 50 kg, moderately active	51.86	51.89	51.93	53.41	19000.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	65.33	65.45	65.18	67.63	23900.00
An adult woman, aged >60y, moderately active	46.19	46.22	46.37	47.82	17000.00
<b>Overall</b>	<b>310.28</b>	<b>310.82</b>	<b>311.16</b>	<b>320.53</b>	<b>113900.00</b>

4. The daily lowest cost diet for the CotD family in Islamabad that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	12.04	12.09	12.09	12.03	4400.00
A child (either sex), aged 8-9 years	41.90	42.07	42.06	41.91	15300.00
A child (either sex), aged 10-11 years	54.59	54.82	54.83	54.61	20000.00
A child (either sex), aged 12-13 years	57.84	58.06	58.06	57.83	21200.00
An adult man, aged 30-59y, 50 kg, moderately active	58.95	59.15	59.13	58.92	21600.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	72.89	73.43	73.34	73.00	26700.00
An adult woman, aged >60y, moderately active	53.09	53.32	53.32	53.10	19400.00
<b>Overall</b>	<b>351.30</b>	<b>352.94</b>	<b>352.82</b>	<b>351.40</b>	<b>128,500.00</b>

5. The daily lowest cost diet for the CotD family in Faisalabad that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

<b>Age Group</b>	<b>Season 1 Winter</b>	<b>Season 2 Spring</b>	<b>Season 3 Summer</b>	<b>Season 4 Autumn</b>	<b>Annual Cost</b>
A child (either sex), aged 12-23 months	12.84	12.92	12.81	12.86	4700.00
A child (either sex), aged 8-9 years	37.74	37.56	37.45	37.84	13700.00
A child (either sex), aged 10-11 years	61.24	60.93	60.23	60.36	22100.00
A child (either sex), aged 12-13 years	62.4	61.8	61.23	61.57	22500.00
An adult man, aged 30-59y, 50 kg, moderately active	52.07	52.1	51.92	52.44	19000.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	56.13	55.8	55.59	56.46	20400.00
An adult woman, aged >60y, moderately active	52.54	53.3	52.88	52.9	19300.00
<b>Overall</b>	<b>334.96</b>	<b>334.41</b>	<b>332.12</b>	<b>334.42</b>	<b>121700.00</b>

6. The daily lowest cost diet for the CotD family in Rajanpur that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

<b>Age Group</b>	<b>Season 1 Winter</b>	<b>Season 2 Spring</b>	<b>Season 3 Summer</b>	<b>Season 4 Autumn</b>	<b>Annual Cost</b>
A child (either sex), aged 12-23 months	14	13.98	14.31	14.08	5200.00
A child (either sex), aged 8-9 years	33.8	33.95	34.24	33.91	12400.00
A child (either sex), aged 10-11 years	53.3	53.54	54.25	53.65	19600.00
A child (either sex), aged 12-13 years	55.41	55.43	56.32	55.64	20400.00
An adult man, aged 30-59y, 50 kg, moderately active	48.3	48.11	48.75	48.21	17700.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	59.51	58.99	58.72	59.77	21600.00
An adult woman, aged >60y, moderately active	52.72	52.83	53.62	52.98	19400.00
<b>Overall</b>	<b>317.04</b>	<b>316.82</b>	<b>320.21</b>	<b>318.24</b>	<b>116300.00</b>

7. The daily lowest cost diet for the CoD family in Haveli that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	19.46	19.19	19.06	19.25	7000.00
A child (either sex), aged 8-9 years	53.27	51.76	50.95	52.28	19000.00
A child (either sex), aged 10-11 years	80.63	80.45	80.24	80.48	29400.00
A child (either sex), aged 12-13 years	83.29	83.02	82.69	83.13	30300.00
An adult man, aged 30-59y, 50 kg, moderately active	75.87	73.82	72.08	74.59	27000.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	85.1	80.32	78.29	81.69	29700.00
An adult woman, aged >60y, moderately active	80.09	79.63	78.48	79.92	29000.00
<b>Overall</b>	<b>477.71</b>	<b>468.19</b>	<b>461.78</b>	<b>471.35</b>	<b>171300.00</b>

8. The daily lowest cost diet for the CoD family in Haveli that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	17.91	20.16	20.02	20.61	7100.00
A child (either sex), aged 8-9 years	43.4	50.69	50.68	51.39	17800.00
A child (either sex), aged 10-11 years	72.03	82.63	82.58	83.43	29100.00
A child (either sex), aged 12-13 years	74.15	83.84	83.84	84.75	29700.00
An adult man, aged 30-59y, 50 kg, moderately active	61.62	71.13	69.64	72.96	24900.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	85.66	80.2	79.41	82.98	30000.00
An adult woman, aged >60y, moderately active	68.19	77.92	77.84	80.77	27600.00
<b>Overall</b>	<b>422.96</b>	<b>466.57</b>	<b>464.01</b>	<b>476.89</b>	<b>166200.00</b>

9. The daily lowest cost diet for the CotD family in Loralai that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season I Winter	Season 2 Spring	Season 3 Sum- mer	Season 4 Au- tumn	Annual Cost
A child (either sex), aged 12-23 months	12.34	12.12	12.06	12.39	4500.00
A child (either sex), aged 8-9 years	35.17	35.54	35.35	35.8	12900.00
A child (either sex), aged 10-11 years	48.44	48.45	48.35	48.71	17700.00
A child (either sex), aged 12-13 years	50.47	50.66	50.51	51	18500.00
An adult man, aged 30-59y, 50 kg, moderately active	49.3	49.64	49.5	50.04	18100.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	68.17	65.68	65.48	68.22	24500.00
An adult woman, aged >60y, moderately active	46.84	47.13	46.96	47.49	17200.00
<b>Overall</b>	<b>310.73</b>	<b>309.23</b>	<b>308.22</b>	<b>313.64</b>	<b>113300.00</b>

10. The daily lowest cost diet for the CotD family in Naseerabad that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season I Winter	Season 2 Spring	Season 3 Sum- mer	Season 4 Au- tumn	Annual Cost
A child (either sex), aged 12-23 months	14.33	14.36	14.33	14.32	5200.00
A child (either sex), aged 8-9 years	39.61	39.62	39.59	39.53	14500.00
A child (either sex), aged 10-11 years	54.84	54.85	54.8	54.73	20000.00
A child (either sex), aged 12-13 years	57.71	57.71	57.68	57.6	21100.00
An adult man, aged 30-59y, 50 kg, moderately active	57.17	57.18	57.15	57.06	20900.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	72.42	72.33	72.18	72.39	26400.00
An adult woman, aged >60y, moderately active	53.8	53.82	53.79	53.72	19600.00
<b>Overall</b>	<b>349.89</b>	<b>349.87</b>	<b>349.52</b>	<b>349.36</b>	<b>127600.00</b>

11. The daily lowest cost diet for the CotD family in Jacobabad that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	12.57	12.7	11.12	12.43	4300.00
A child (either sex), aged 8-9 years	47.41	45.78	40.4	46.55	16000.00
A child (either sex), aged 10-11 years	62.5	60.51	53.23	61.4	21100.00
A child (either sex), aged 12-13 years	64.67	62.61	55.36	63.53	21900.00
An adult man, aged 30-59y, 50 kg, moderately active	64.67	62.51	55.28	63.44	21900.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	78.54	76.94	66.51	77.38	26500.00
An adult woman, aged >60y, moderately active	61.51	59.51	52.19	60.37	20700.00
<b>Overall</b>	<b>391.86</b>	<b>380.56</b>	<b>334.08</b>	<b>385.1</b>	<b>132500.00</b>

12. The daily lowest cost diet for the CotD family in Sanghar that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	10.88	11.03	10.77	10.91	4000.00
A child (either sex), aged 8-9 years	38.52	37.72	36.08	36.81	13500.00
A child (either sex), aged 10-11 years	48.53	47.68	45.68	46.51	17100.00
A child (either sex), aged 12-12 years	51.4	51.3	48.88	49.96	18300.00
An adult man, aged 30-59y, 50 kg, moderately active	54.64	53.9	51.32	52.55	19300.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	61.75	61.41	59.56	60.3	22100.00
An adult woman, aged >60y, moderately active	46.71	46.64	44.21	45.2	16600.00
<b>Overall</b>	<b>312.44</b>	<b>309.68</b>	<b>296.51</b>	<b>302.24</b>	<b>110800.00</b>

13. The daily lowest cost diet for the CotD family in Sanghar that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	10.84	10.96	10.88	10.94	4000.00
A child (either sex), aged 8-9 years	37.8	38.02	37.61	37.93	13800.00
A child (either sex), aged 10-11 years	47.65	48.13	47.37	48.01	17400.00
A child (either sex), aged 12-13 years	50.98	51.45	51.09	51.38	18700.00
An adult man, aged 30-59y, 50 kg, moderately active	54.15	54.58	53.76	54.51	19800.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	63.73	63.66	62.15	63.32	23000.00
An adult woman, aged >60y, moderately active	46.62	47.12	46.59	47.02	17100.00
<b>Overall</b>	<b>311.77</b>	<b>313.92</b>	<b>309.44</b>	<b>313.11</b>	<b>113700.00</b>

14. The daily lowest cost diet for the CotD family in Gilgit that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	13.72	12.72	12.34	13.72	4800.00
A child (either sex), aged 8-9 years	37.37	34.06	33.08	37.37	13000.00
A child (either sex), aged 10-11 years	50.14	45.21	43.95	50.14	17300.00
A child (either sex), aged 12-13 years	51.66	46.93	45.64	51.66	17900.00
An adult man, aged 30-59y, 50 kg, moderately active	50.97	47	45.64	50.97	17800.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	76.88	68.46	67.28	76.88	26500.00
An adult woman, aged >60y, moderately active	48.4	43.44	42.17	48.4	16700.00
<b>Overall</b>	<b>329.12</b>	<b>297.82</b>	<b>290.11</b>	<b>329.12</b>	<b>113900.00</b>

15. The daily lowest cost diet for the CotD family in Gilgit that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	13.31	12.89	11.28	13.31	4600.00
A child (either sex), aged 8-9 years	31.28	30.96	31.03	31.28	11400.00
A child (either sex), aged 10-11 years	46.69	45.97	42.77	46.69	16500.00
A child (either sex), aged 12-13 years	46.27	45.6	42.95	46.27	16400.00
An adult man, aged 30-59y, 50 kg, moderately active	42.42	41.99	41.74	42.42	15400.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	73.22	70.45	60.69	73.22	25100.00
An adult woman, aged >60y, moderately active	40.81	40.32	38.97	40.81	14600.00
<b>Overall</b>	<b>293.99</b>	<b>288.18</b>	<b>269.43</b>	<b>293.99</b>	<b>104000.00</b>

16. The daily lowest cost diet for the CotD family in Khyber Agency that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	9.63	10.01	14.02	10.38	4100.00
A child (either sex), aged 8-9 years	33.27	34.36	44.08	35.37	13700.00
A child (either sex), aged 10-11 years	41.58	43.11	57.07	43.99	17300.00
A child (either sex), aged 12-13 years	44.79	46.27	57.64	47.53	18200.00
An adult man, aged 30-59y, 50 kg, moderately active	48.42	50.01	59.45	51.69	19300.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	56.04	57.61	81.99	58.92	23900.00
An adult woman, aged >60y, moderately active	41.04	42.38	56.67	43.5	17100.00
<b>Overall</b>	<b>274.75</b>	<b>283.74</b>	<b>370.91</b>	<b>291.39</b>	<b>113700.00</b>

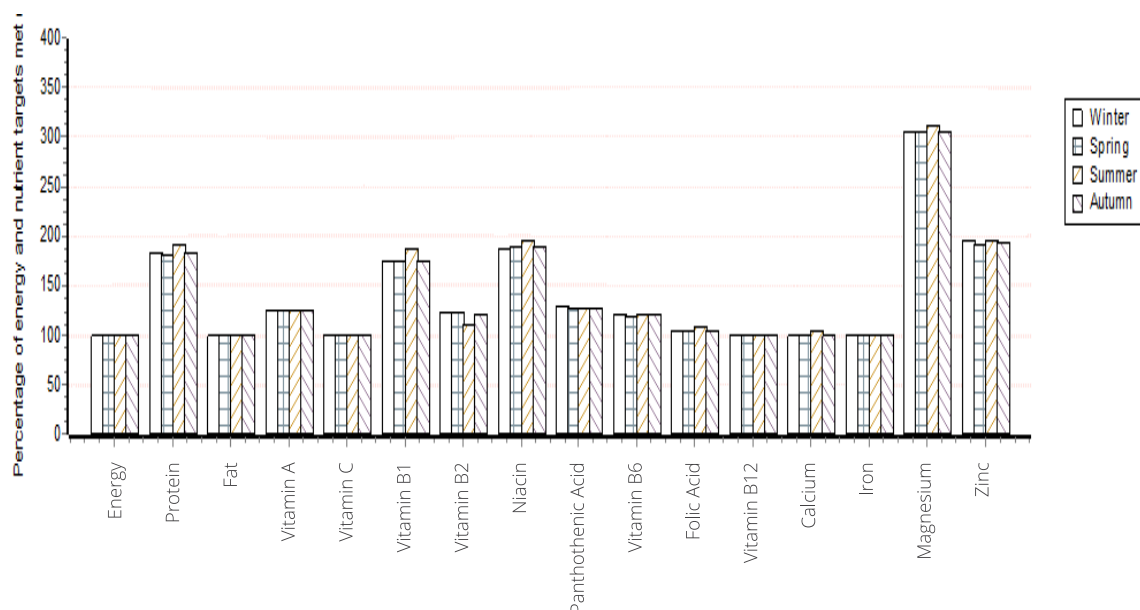


17. The daily lowest cost diet for the CotD family in Khyber Agency that meets needs for energy and micronutrient but does not consider the typical dietary habits. The annual costs have been rounded to the nearest 100 PKR.

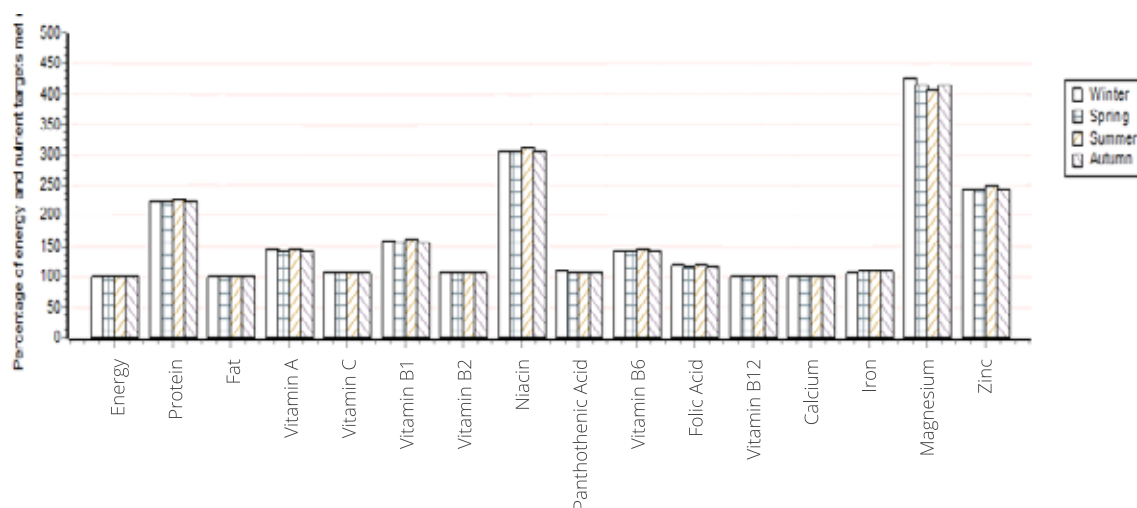
Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	10.44	10.36	10.37	10.44	3800.00
A child (either sex), aged 8-9 years	34.83	34.4	34.77	34.83	12700.00
A child (either sex), aged 10-11 years	44.05	43.69	44.49	44.05	16100.00
A child (either sex), aged 12-13 years	47.05	46.35	46.82	47.05	17100.00
An adult man, aged 30-59y, 50 kg, moderately active	50.05	49.22	49.18	50.05	18100.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	62.31	62.44	64.68	62.31	23000.00
An adult woman, aged >60y, moderately active	43.2	42.61	43.27	43.2	15700.00
<b>Overall</b>	<b>291.94</b>	<b>289.07</b>	<b>293.57</b>	<b>291.94</b>	<b>106600.00</b>

Annex 2.4 The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season

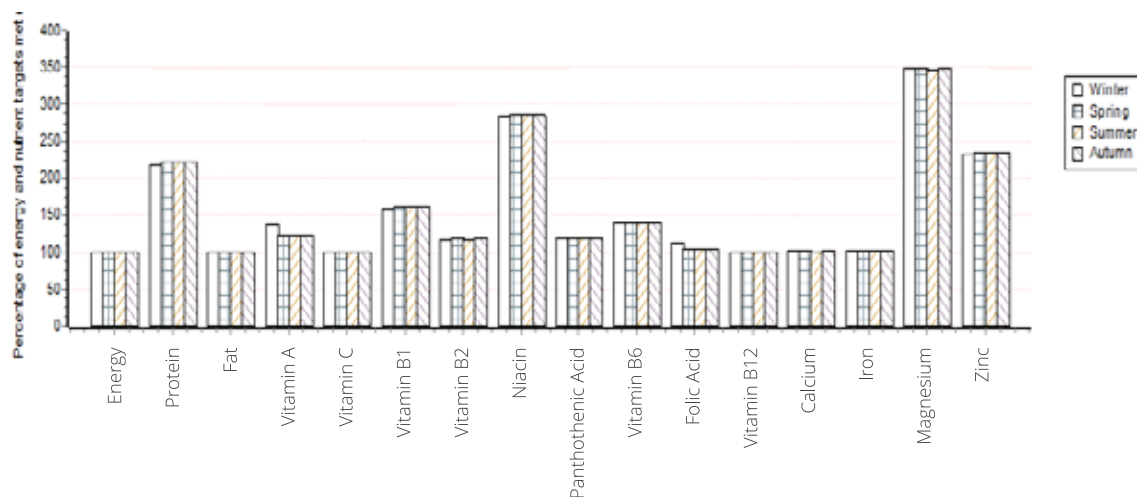
1. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Charsadda livestock/poultry livelihood zone



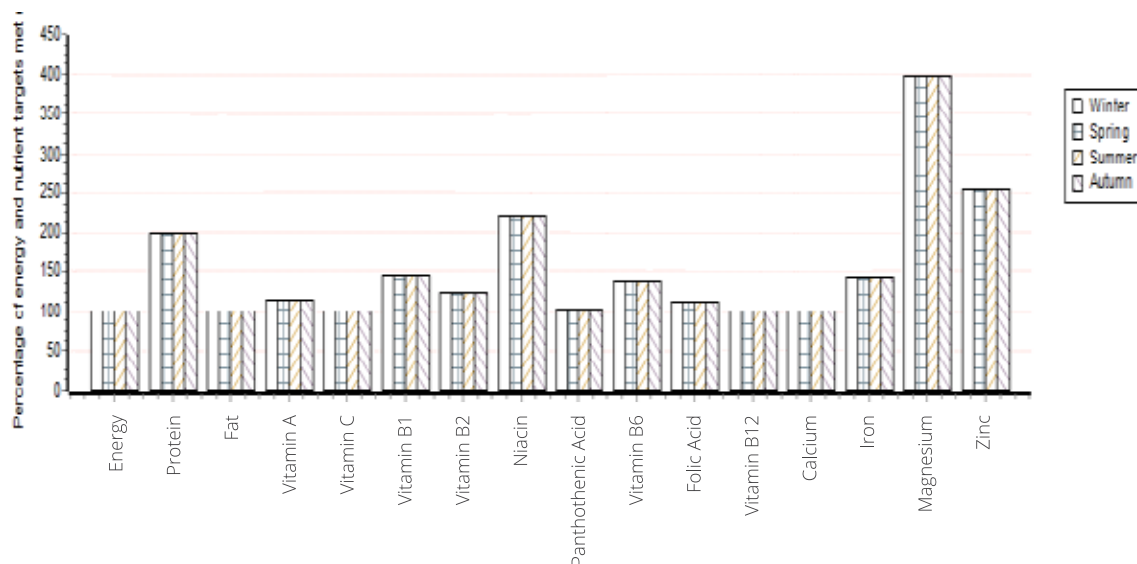
2. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Tank agriculture livelihood zone



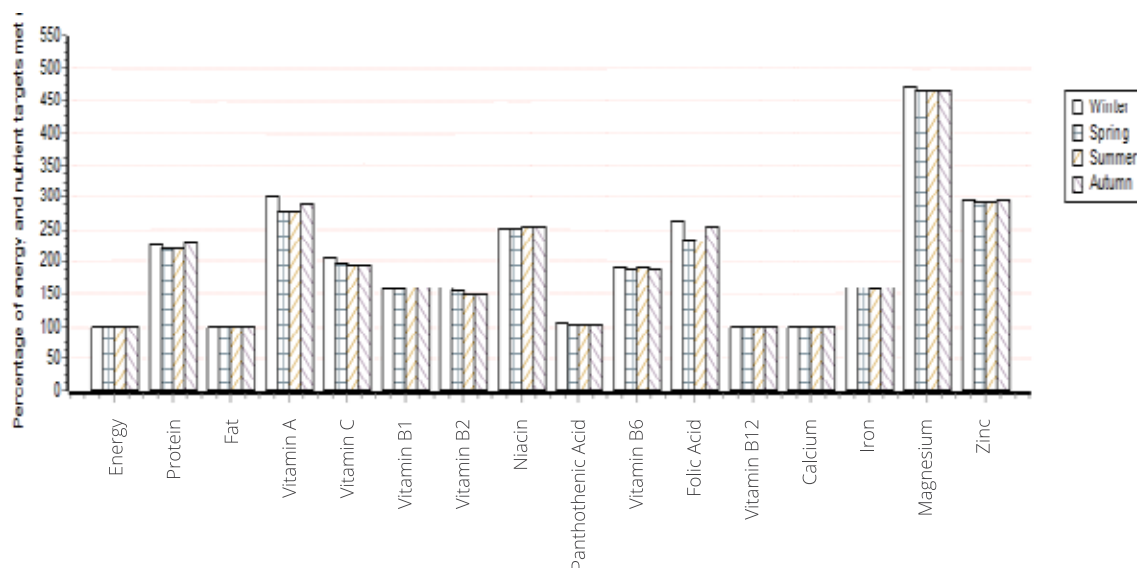
3. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Tank Livestock/Poultry livelihood zone



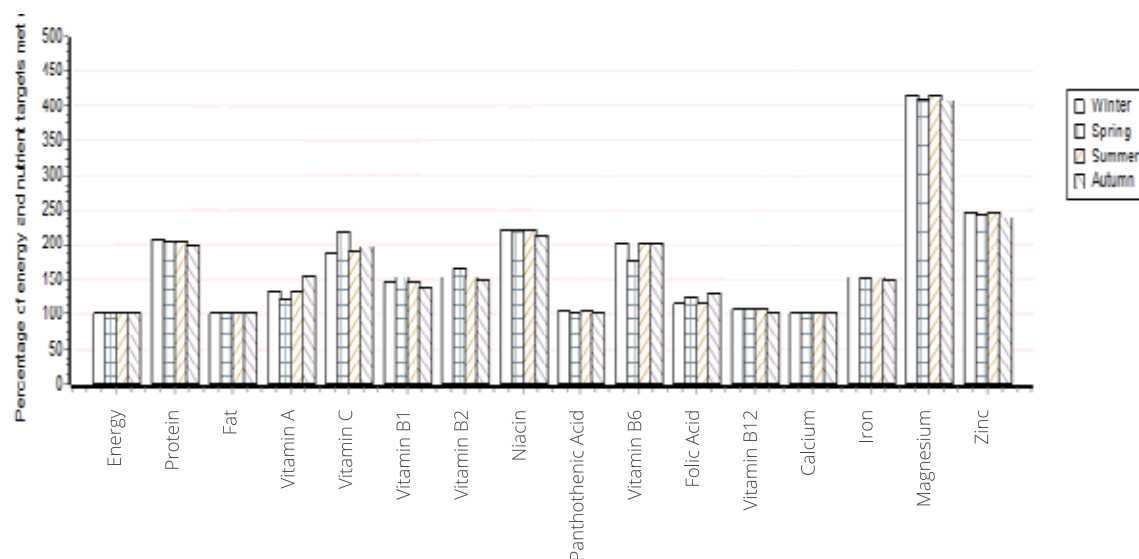
4. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Islamabad paid/unpaid livelihood zone



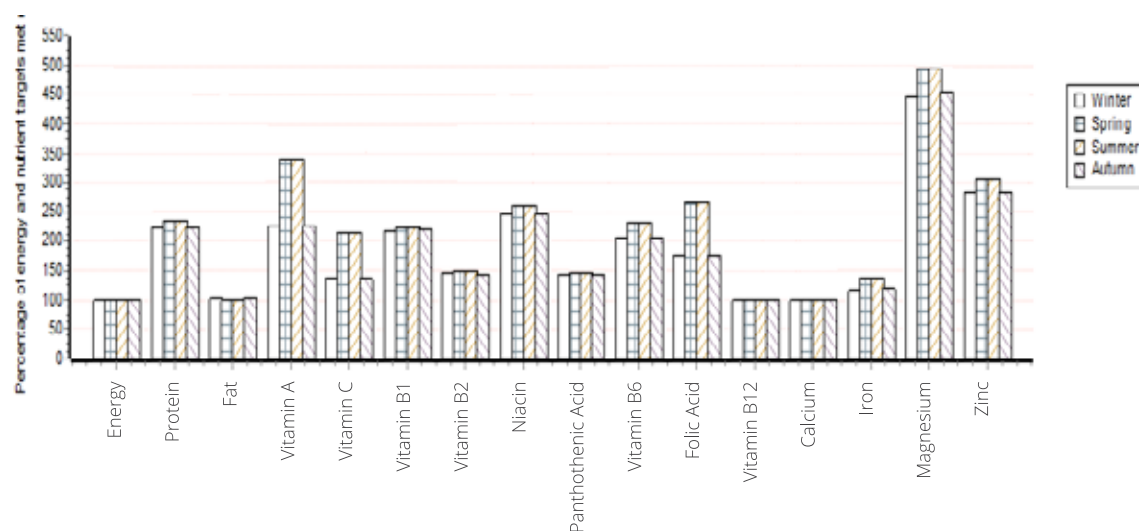
5. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Faisalabad agriculture livelihood zone



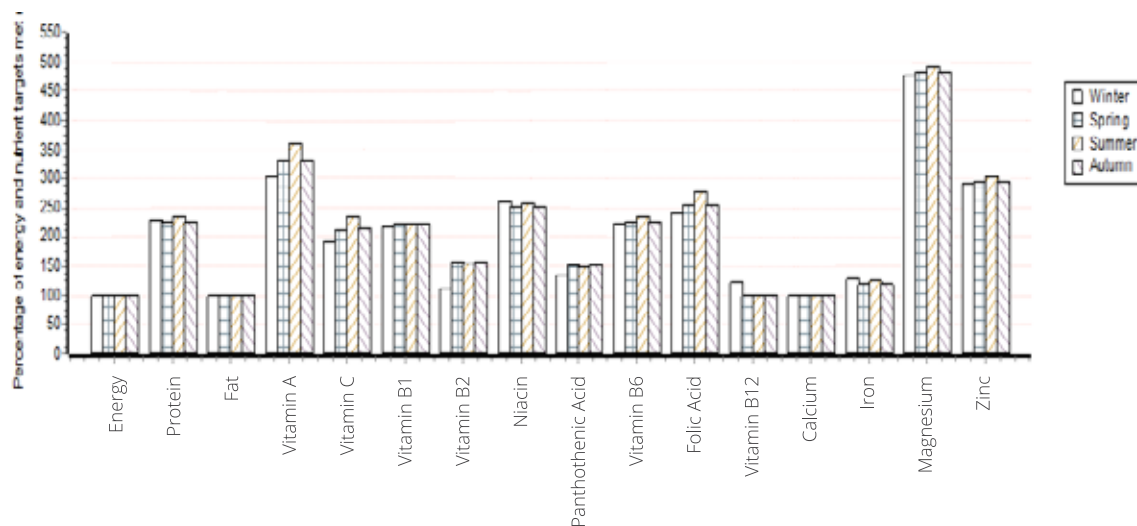
6. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Rajanpur agriculture livelihood zone



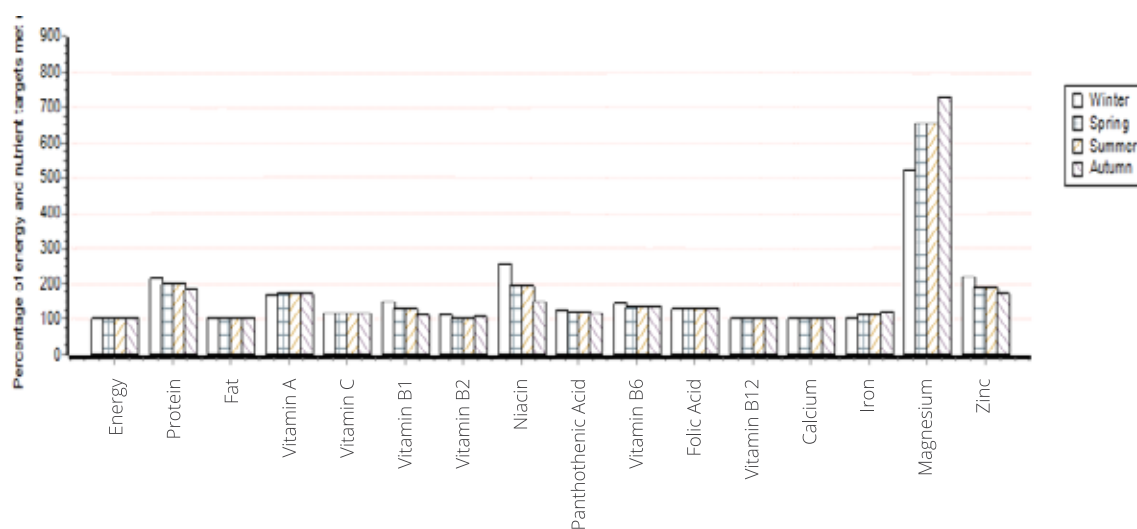
7. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Haveli agriculture livelihood zone



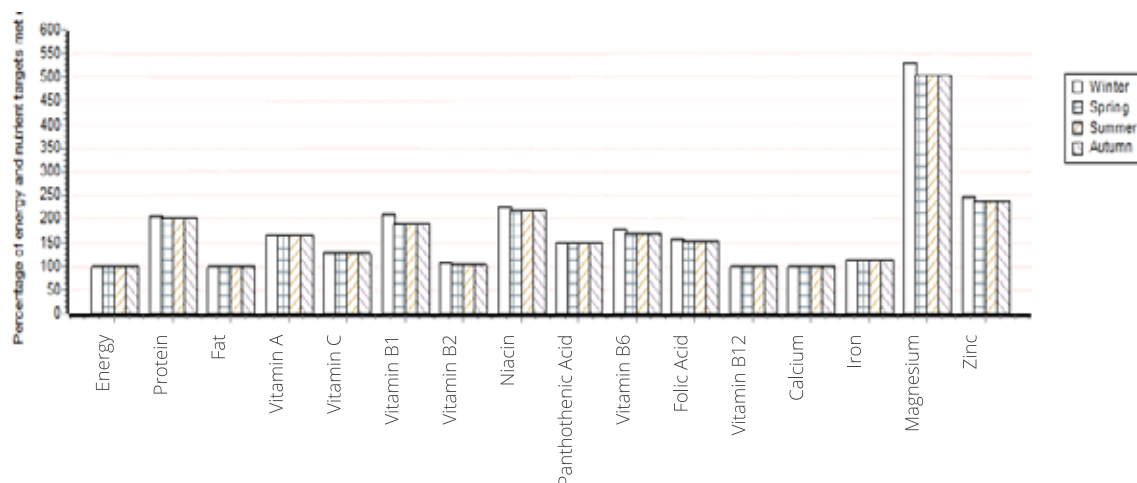
8. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Haveli Livestock/Poultry livelihood zone



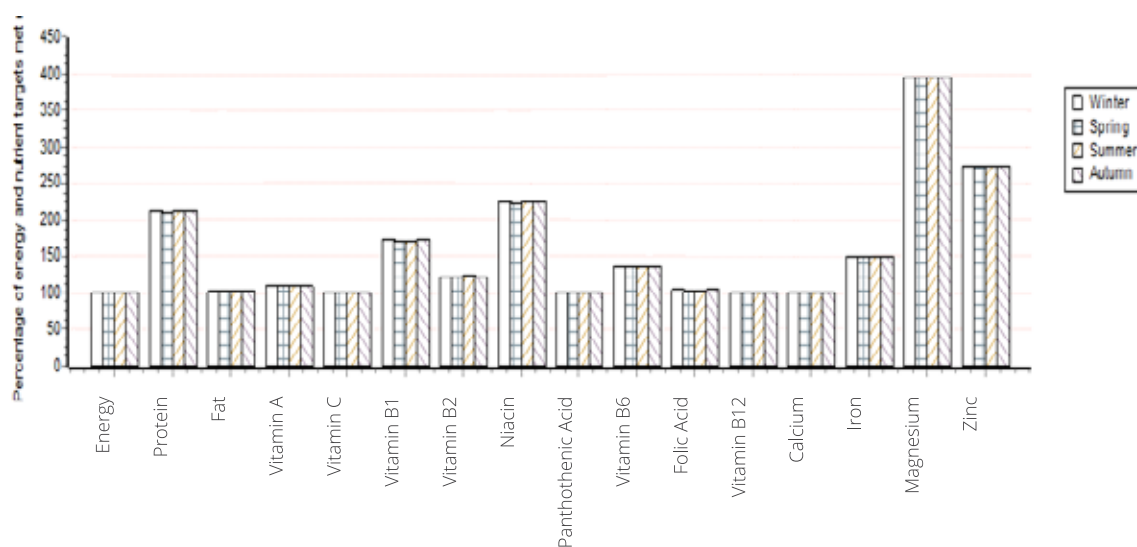
9. The average percentage of energy and the recommended nutrient intakes for micro-nutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Loralai agriculture livelihood zone



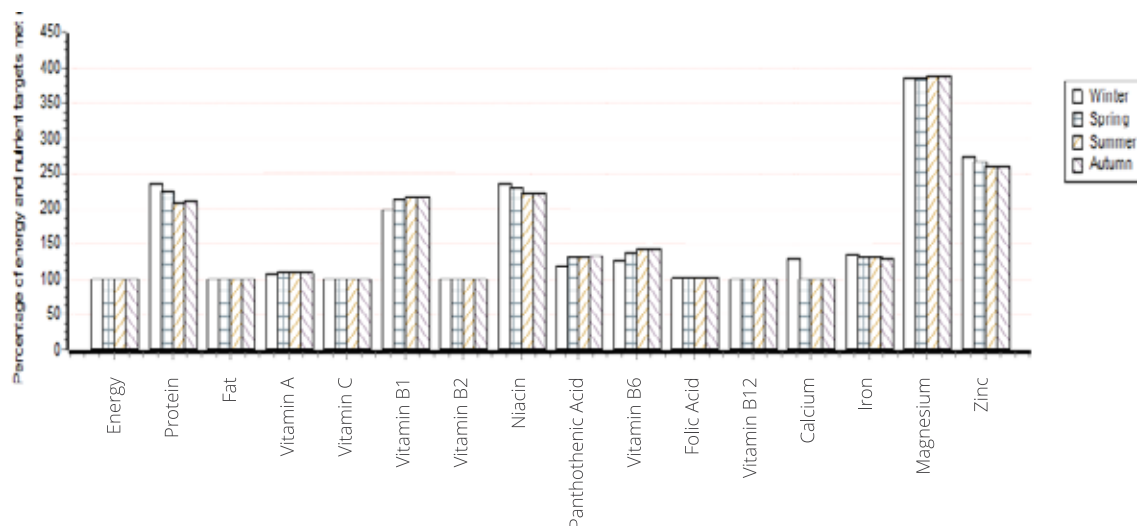
10. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Naseerabad agriculture livelihood zone



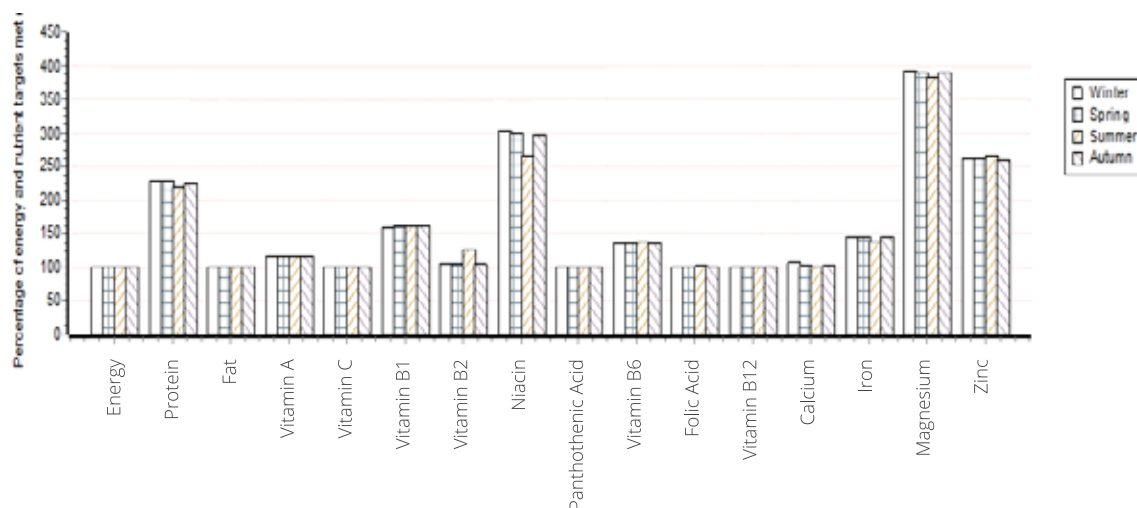
11. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Jacobabad agriculture livelihood zone



12. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Sanghar Agriculture livelihood zone

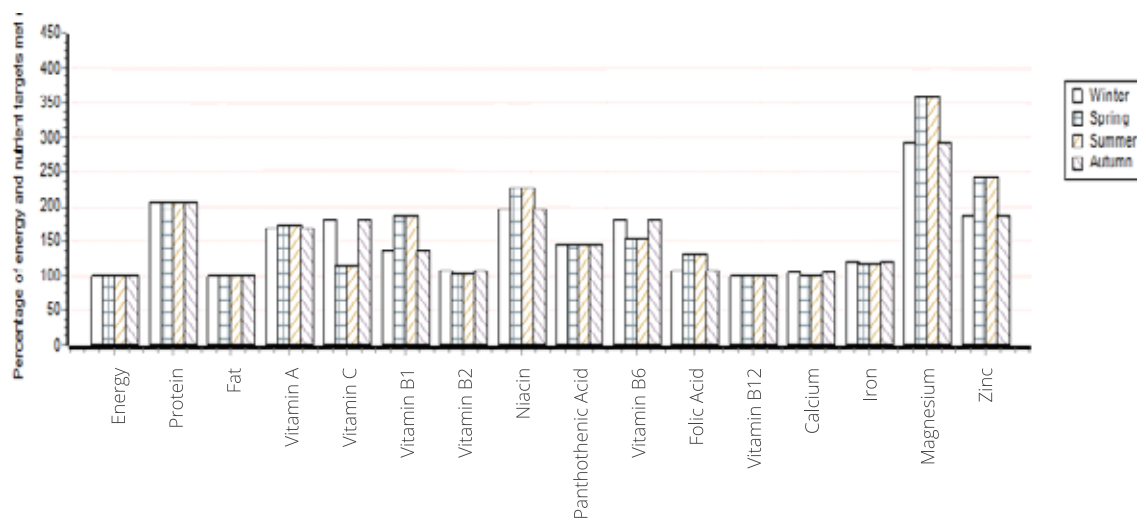


13. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Sanghar Livestock/Poultry livelihood zone

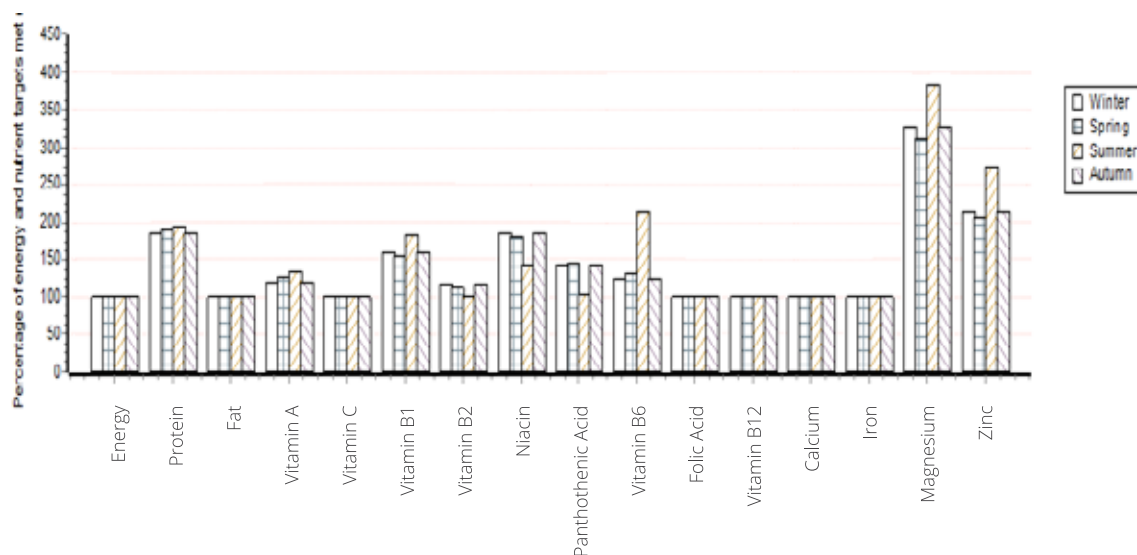




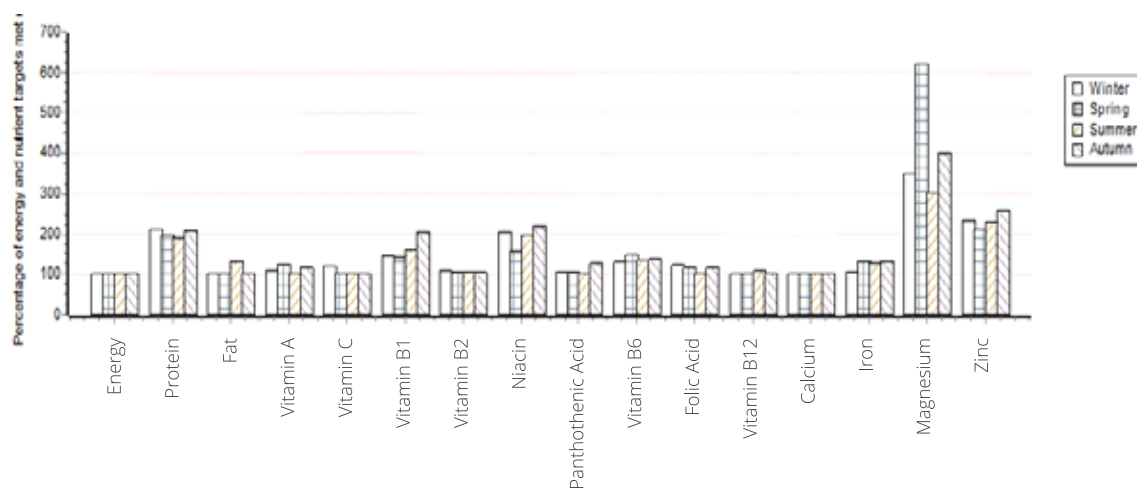
14. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Gilgit agriculture livelihood zone



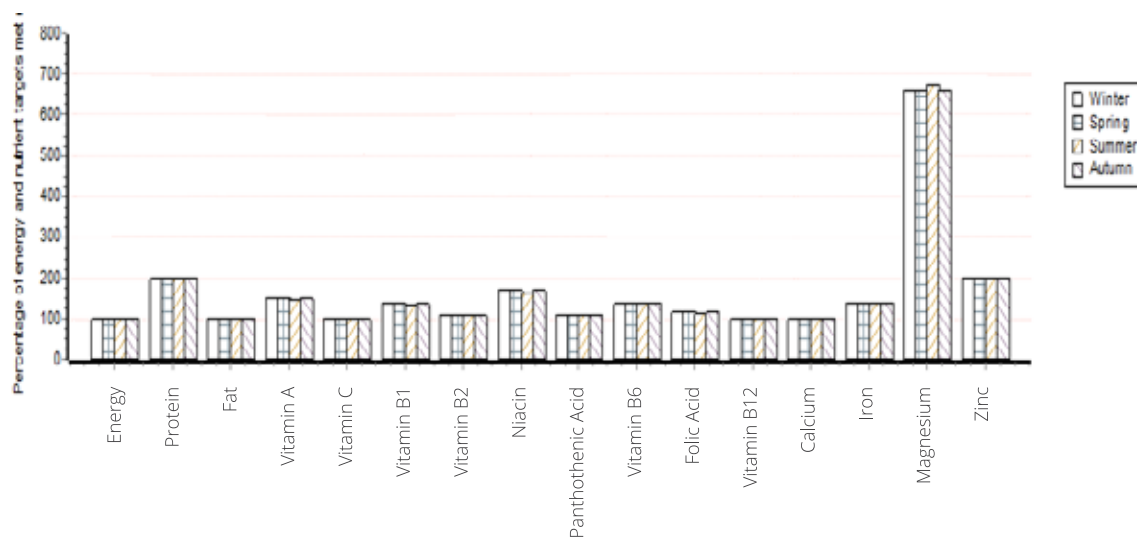
15. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Gilgit Livestock/Poultry livelihood zone



16. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Khyber Agency Agriculture livelihood zone



17. The average percentage of energy and the recommended nutrient intakes for micronutrients met in a year by a nutritious (macro – micronutrient) diet for the family, by season in Khyber Agency Paid/Unpaid livelihood zone



Annex 2.5 The lowest cost diet for the CotD family that meets needs for energy and micro-nutrients and is adjusted to account for usual dietary habits.

1. The lowest cost diet for the CotD family in Charsadda, Pakistan that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	21.97	22.03	22.41	23.73	8200.00
A child (either sex), aged 8-9 years	47.93	47.69	48.03	48.91	17500.00
A child (either sex), aged 10-11 years	66.1	65.78	66.2	67.82	24200.00
A child (either sex), aged 12-13 years	68.72	68.19	68.64	70.27	25100.00
An adult man, aged 30-59y, 50 kg, moderately active	69.3	68.8	69.34	70.81	25400.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	123.48	124.37	125.68	129.24	45800.00
An adult woman, aged >60y, moderately active	59.9	59.74	60.17	61.31	22000.00
<b>Overall</b>	<b>457.41</b>	<b>456.60</b>	<b>460.47</b>	<b>472.08</b>	<b>168200.00</b>

2. The lowest cost diet for the CotD family in Tank agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	23.72	23.69	23.75	24.43	8700.00
A child (either sex), aged 8-9 years	47.52	47.33	47.36	48.52	17400.00
A child (either sex), aged 10-11 years	84.1	83.27	82.37	85.71	30500.00
A child (either sex), aged 12-13 years	83.48	82.72	82.88	85.11	30400.00
An adult man, aged 30-59y, 50 kg, moderately active	67.57	67.52	67.91	69.35	24800.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	130.74	129.75	120.42	131.04	46100.00
An adult woman, aged >60y, moderately active	81.85	81.09	79.34	83.18	29500.00
<b>Overall</b>	<b>518.99</b>	<b>515.36</b>	<b>504.02</b>	<b>527.34</b>	<b>187400.00</b>

3. The lowest cost diet for the CotD family in Tank Livestock/Poultry zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	16.34	16.33	18.68	19.82	6500.00
A child (either sex), aged 8-9 years	42.06	42.13	43.43	44.72	15700.00
A child (either sex), aged 10-11 years	61.47	61.57	69.8	71.75	24200.00
A child (either sex), aged 12-13 years	64.38	64.44	72.73	74.42	25200.00
An adult man, aged 30-59y, 50 kg, moderately active	60.97	61.02	62.97	64.68	22700.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	85.28	85.5	89.36	98.83	32400.00
An adult woman, aged >60y, moderately active	60.31	60.35	68.53	70.45	23700.00
<b>Overall</b>	<b>390.8</b>	<b>391.34</b>	<b>425.49</b>	<b>444.67</b>	<b>150500.00</b>

4. The lowest cost diet for the CotD family in Islamabad that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	24.52	24.68	24.51	24.78	9000.00
A child (either sex), aged 8-9 years	58.46	58.73	58.12	58.96	21300.00
A child (either sex), aged 10-11 years	74.61	74.95	74.19	75.21	27200.00
A child (either sex), aged 12-13 years	81	81.36	80.56	81.68	29600.00
An adult man, aged 30-59y, 50 kg, moderately active	85.24	85.62	84.77	86.00	31100.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	125.39	125.79	124.34	125.84	45700.00
An adult woman, aged >60y, moderately active	73.13	73.46	72.69	73.72	26700.00
<b>Overall</b>	<b>522.36</b>	<b>524.6</b>	<b>519.17</b>	<b>526.18</b>	<b>190500.00</b>

5. The lowest cost diet for the CotD family in Faisalabad, Pakistan that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	20.98	21.8	21.81	21.96	7900.00
A child (either sex), aged 8-9 years	52.55	53.87	54.1	53.36	19600.00
A child (either sex), aged 10-11 years	79.94	84.01	83.57	80.61	30000.00
A child (either sex), aged 12-13 years	84.06	88.41	88.14	84.96	31700.00
An adult man, aged 30-59y, 50 kg, moderately active	75.91	77.46	77.65	77.24	28100.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	101.31	101.33	101.05	103.59	37000.00
An adult woman, aged >60y, moderately active	78.87	81.19	80.65	79.54	29200.00
<b>Overall</b>	<b>493.62</b>	<b>508.07</b>	<b>506.98</b>	<b>501.27</b>	<b>183500.00</b>

6. The lowest cost diet for the CotD family in Rajanpur agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	17.7	17.82	17.76	17.88	6500.00
A child (either sex), aged 8-9 years	41.03	40.93	41.25	40.92	15000.00
A child (either sex), aged 10-11 years	63.11	63.81	64.3	63.53	23300.00
A child (either sex), aged 12-13 years	65.86	66.38	66.98	66.17	24300.00
An adult man, aged 30-59y, 50 kg, moderately active	58.84	58.57	59.12	58.58	21500.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	87.82	87.29	86.11	88.4	31700.00
An adult woman, aged >60y, moderately active	61.47	61.73	62.47	61.41	22600.00
<b>Overall</b>	<b>395.83</b>	<b>396.53</b>	<b>397.99</b>	<b>396.88</b>	<b>144900.00</b>

7. The lowest cost diet for the CotD family in Haveli agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season I Winter	Season 2 Spring	Season 3 Sum- mer	Season 4 Au- tumn	Annual Cost
A child (either sex), aged 12-23 months	27.36	24.54	24.26	24.72	9200.00
A child (either sex), aged 8-9 years	60.3	59.55	59.21	59.76	21800.00
A child (either sex), aged 10-11 years	101.99	94.72	93.95	95.23	35300.00
A child (either sex), aged 12-13 years	101.78	97.46	96.94	97.79	36000.00
An adult man, aged 30-59y, 50 kg, moderately active	86.53	85.7	85.2	85.9	31300.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	134.56	120.87	118.7	122.21	45400.00
An adult woman, aged >60y, moderately active	92.91	90.2	90.17	90.21	33200.00
<b>Overall</b>	<b>605.43</b>	<b>573.04</b>	<b>568.43</b>	<b>575.82</b>	<b>212200.00</b>

8. The lowest cost diet for the CotD family in Haveli Livestock/Poultry zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season I Winter	Season 2 Spring	Season 3 Sum- mer	Season 4 Au- tumn	Annual Cost
A child (either sex), aged 12-23 months	25.42	25.47	25.23	25.58	9300.00
A child (either sex), aged 8-9 years	60.1	60.13	59.77	60.56	21900.00
A child (either sex), aged 10-11 years	95.95	97.71	96.91	97.11	35300.00
A child (either sex), aged 12-13 years	98.62	100.24	99.69	99.88	36300.00
An adult man, aged 30-59y, 50 kg, moderately active	85.01	84.59	84.39	85.86	31000.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	127.23	118.1	117.04	118.72	44000.00
An adult woman, aged >60y, moderately active	91	91.5	91.48	92.21	33400.00
<b>Overall</b>	<b>583.33</b>	<b>577.75</b>	<b>574.51</b>	<b>579.91</b>	<b>211200.00</b>

9. The lowest cost diet for the CotD family in Loralai agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	22.49	21.58	21.55	22.46	8100.00
A child (either sex), aged 8-9 years	46.76	45.98	45.93	47.29	17000.00
A child (either sex), aged 10-11 years	65.42	62.44	62.28	65.72	23400.00
A child (either sex), aged 12-13 years	67.29	65.68	65.59	67.8	24300.00
An adult man, aged 30-59y, 50 kg, moderately active	67.86	66.54	66.46	68.7	24600.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	120.78	112.52	111.44	120.72	42600.00
An adult woman, aged >60y, moderately active	60.64	59.62	59.57	61.27	22000.00
<b>Overall</b>	<b>451.25</b>	<b>434.35</b>	<b>432.81</b>	<b>453.97</b>	<b>162000.00</b>

10. The lowest cost diet for the CotD family in Naseerabad agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	20.06	20.07	20.03	20.07	7300.00
A child (either sex), aged 8-9 years	47.99	48.06	47.96	48.05	17500.00
A child (either sex), aged 10-11 years	70.21	70.5	70.38	70.27	25700.00
A child (either sex), aged 12-13 years	73.19	73.48	73.34	73.35	26800.00
An adult man, aged 30-59y, 50 kg, moderately active	70.2	70.4	70.22	70.35	25700.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	105.96	107.17	106.28	105.56	38800.00
An adult woman, aged >60y, moderately active	67.97	68.24	68.08	68.09	24900.00
<b>Overall</b>	<b>455.57</b>	<b>457.93</b>	<b>456.29</b>	<b>455.75</b>	<b>166500.00</b>



11. The lowest cost diet for the CotD family in Jacobabad agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	25.78	25.99	22.89	29.33	9100.00
A child (either sex), aged 8-9 years	66.68	61.78	56.94	72.2	22700.00
A child (either sex), aged 10-11 years	85.08	79.42	72.56	91.5	29000.00
A child (either sex), aged 12-13 years	91.58	84.62	78.55	99.16	31300.00
An adult man, aged 30-59y, 50 kg, moderately active	97.18	89.26	83.66	105.87	33200.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	143.96	143.26	124.84	153.38	49700.00
An adult woman, aged >60y, moderately active	84.39	78.48	71.92	90.68	28700.00
<b>Overall</b>	<b>594.65</b>	<b>562.81</b>	<b>511.36</b>	<b>642.13</b>	<b>203800.00</b>

12. The lowest cost diet for the CotD family in Sanghar Agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	20.66	21.63	21.68	21.91	7800.00
A child (either sex), aged 8-9 years	49.25	50.61	50.67	51.09	18400.00
A child (either sex), aged 10-11 years	78.38	80.64	81.09	81.86	29400.00
A child (either sex), aged 12-12 years	81.25	82.96	82.65	84.3	30200.00
An adult man, aged 30-59y, 50 kg, moderately active	70.51	72.25	73.13	73	26400.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	103.85	100.2	98.06	98.95	36500.00
An adult woman, aged >60y, moderately active	76.85	79.24	80.1	80.45	28900.00
<b>Overall</b>	<b>480.75</b>	<b>487.53</b>	<b>487.38</b>	<b>491.57</b>	<b>177600.00</b>

13. The lowest cost diet for the CotD family in Sanghar Livestock/Poultry zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	24.18	27.29	27.76	26.75	9700.00
A child (either sex), aged 8-9 years	55.71	61.13	62.45	60.53	22000.00
A child (either sex), aged 10-11 years	85.79	92.81	94.77	91.94	33500.00
A child (either sex), aged 12-13 years	87.53	95.56	98.05	94.64	34500.00
An adult man, aged 30-59y, 50 kg, moderately active	81.36	89.66	91.58	88.75	32200.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	107.51	111.25	110.55	109.7	40100.00
An adult woman, aged >60y, moderately active	81.87	88.82	90.83	87.96	32000.00
<b>Overall</b>	<b>523.95</b>	<b>566.51</b>	<b>575.98</b>	<b>560.28</b>	<b>204000.00</b>

14. The lowest cost diet for the CotD family in Gilgit agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	22.62	20.2	18.75	22.62	7700.00
A child (either sex), aged 8-9 years	52.33	48.5	44.8	52.33	18000.00
A child (either sex), aged 10-11 years	67.61	62.72	58.26	67.61	23300.00
A child (either sex), aged 12-13 years	72.37	65.8	60.84	72.37	24700.00
An adult man, aged 30-59y, 50 kg, moderately active	75.38	70.05	64.54	75.38	25900.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	114.44	102.79	95.56	114.44	38900.00
An adult woman, aged >60y, moderately active	66.48	60.28	55.89	66.48	22700.00
<b>Overall</b>	<b>471.23</b>	<b>430.34</b>	<b>398.65</b>	<b>471.23</b>	<b>161200.00</b>

15. The lowest cost diet for the CotD family in Gilgit Livestock/Poultry zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	28.36	25.13	20.34	28.36	9200.00
A child (either sex), aged 8-9 years	51.63	50.62	44.26	51.63	17900.00
A child (either sex), aged 10-11 years	74.24	70.47	59.36	74.24	25100.00
A child (either sex), aged 12-13 years	75.63	73.35	61.19	75.63	25700.00
An adult man, aged 30-59y, 50 kg, moderately active	73.74	72.27	62.76	73.74	25500.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	129.54	117.14	96.32	129.54	42600.00
An adult woman, aged >60y, moderately active	64.14	62.65	54.12	64.14	22100.00
<b>Overall</b>	<b>497.28</b>	<b>471.62</b>	<b>398.34</b>	<b>497.28</b>	<b>168200.00</b>

16. The lowest cost diet for the CotD family in Khyber Agency Agriculture zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

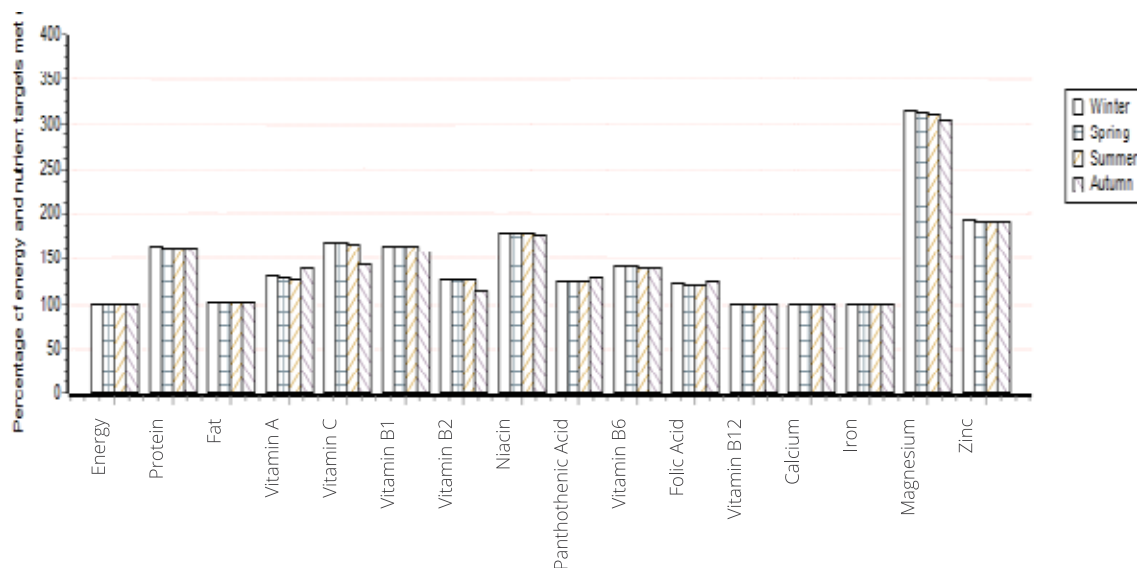
Age Group	Season 1 Winter	Season 2 Spring	Season 3 Summer	Season 4 Autumn	Annual Cost
A child (either sex), aged 12-23 months	25.76	24.75	31.58	25.62	10000.00
A child (either sex), aged 8-9 years	52.34	49.64	58.64	51.85	19700.00
A child (either sex), aged 10-11 years	64.27	60.93	75.82	63.58	24600.00
A child (either sex), aged 12-13 years	70.87	67.25	78.07	69.95	26500.00
An adult man, aged 30-59y, 50 kg, moderately active	77.36	73.82	81.48	77.19	28500.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	115.52	113.15	137.11	115.91	44700.00
An adult woman, aged >60y, moderately active	62.82	60.15	74.05	62.64	24100.00
<b>Overall</b>	<b>468.93</b>	<b>449.7</b>	<b>536.75</b>	<b>466.74</b>	<b>178200.00</b>

17. The lowest cost diet for the CotD family in Khyber Agency Paid/Unpaid zone that meets needs for energy and micronutrients and is adjusted to account for usual dietary habits. The annual costs have been rounded to the nearest 100 PKR.

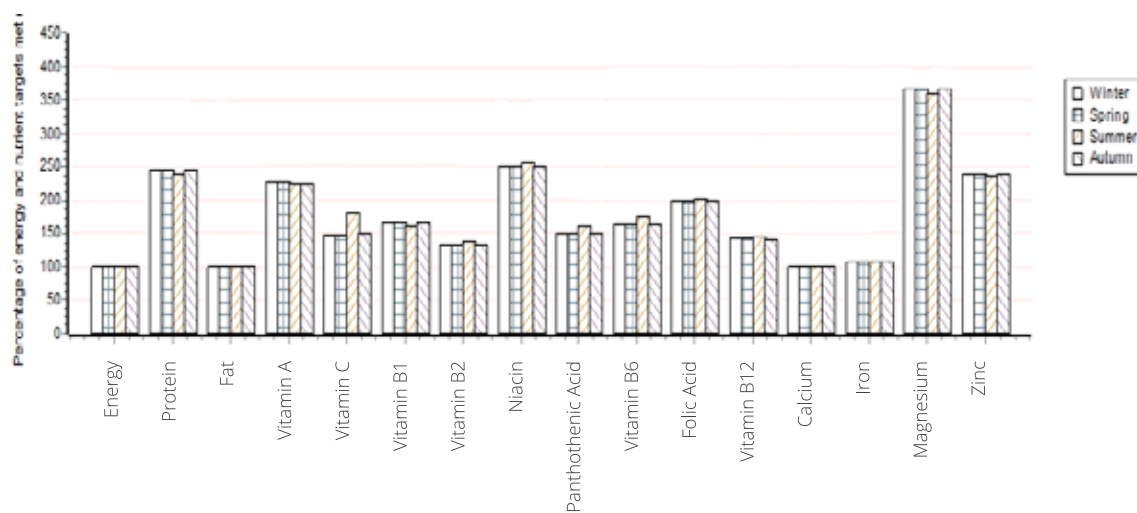
Age Group	Season I Winter	Season 2 Spring	Season 3 Sum- mer	Season 4 Au- tumn	Annual Cost
A child (either sex), aged 12-23 months	13.36	13.3	13.92	13.36	4900.00
A child (either sex), aged 8-9 years	36.65	36.49	36.84	36.65	13400.00
A child (either sex), aged 10-11 years	45.93	45.76	46.55	45.93	16800.00
A child (either sex), aged 12-13 years	49.75	49.53	49.97	49.75	18200.00
An adult man, aged 30-59y, 50 kg, moderately active	53.27	53.01	52.86	53.27	19400.00
An adult woman, aged 30-59y, 45 kg, moderately active, lactating	88.92	88.8	91.18	88.92	32700.00
An adult woman, aged >60y, moderately active	45.62	45.44	46.03	45.62	16700.00
<b>Overall</b>	<b>333.5</b>	<b>332.34</b>	<b>337.35</b>	<b>333.5</b>	<b>122100.00</b>

## Annex 2.6. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season

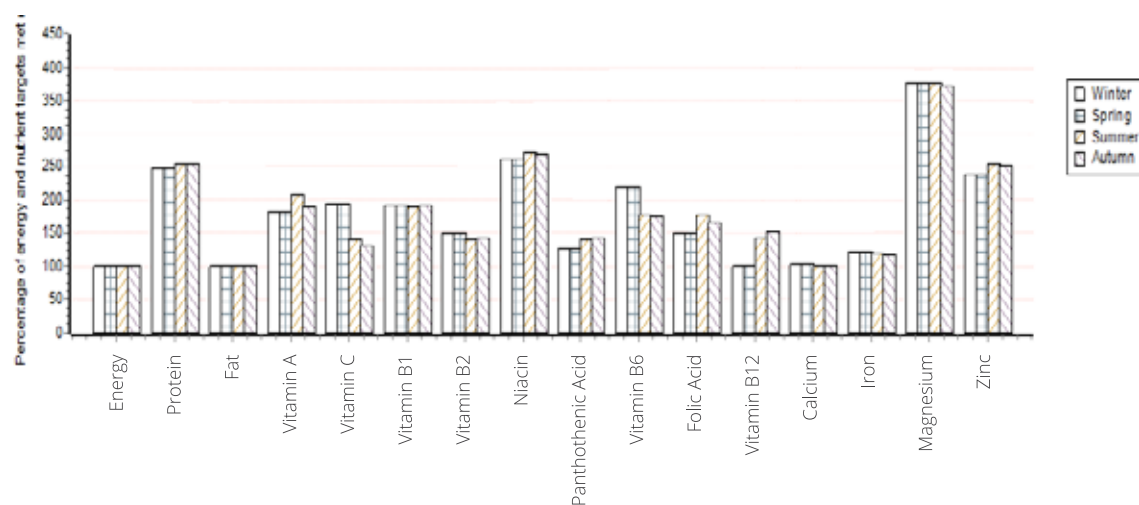
### 1. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Charsadda livestock/poultry livelihood zone



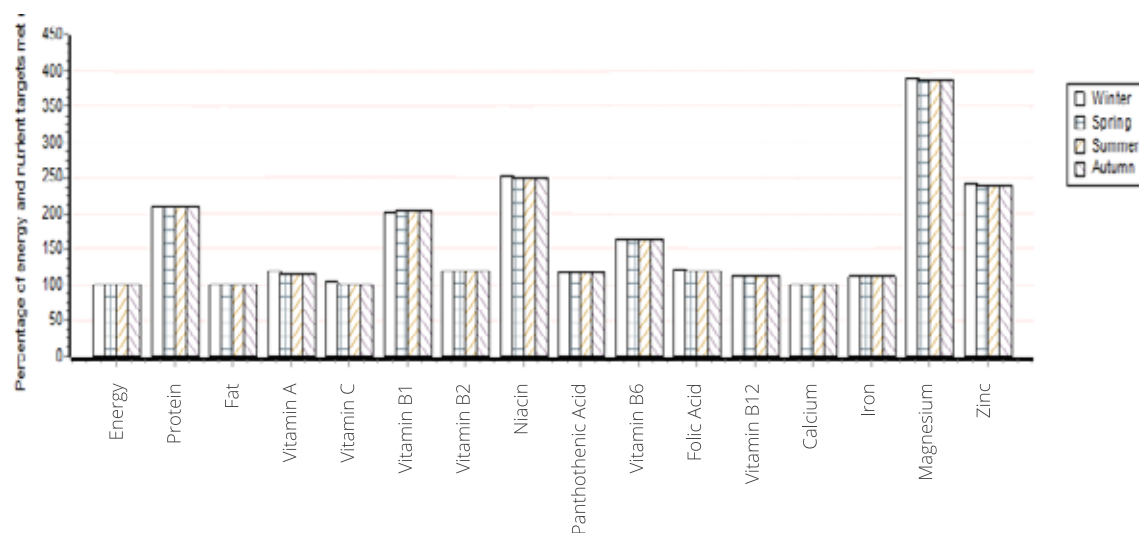
### 2. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Tank agriculture livelihood zone



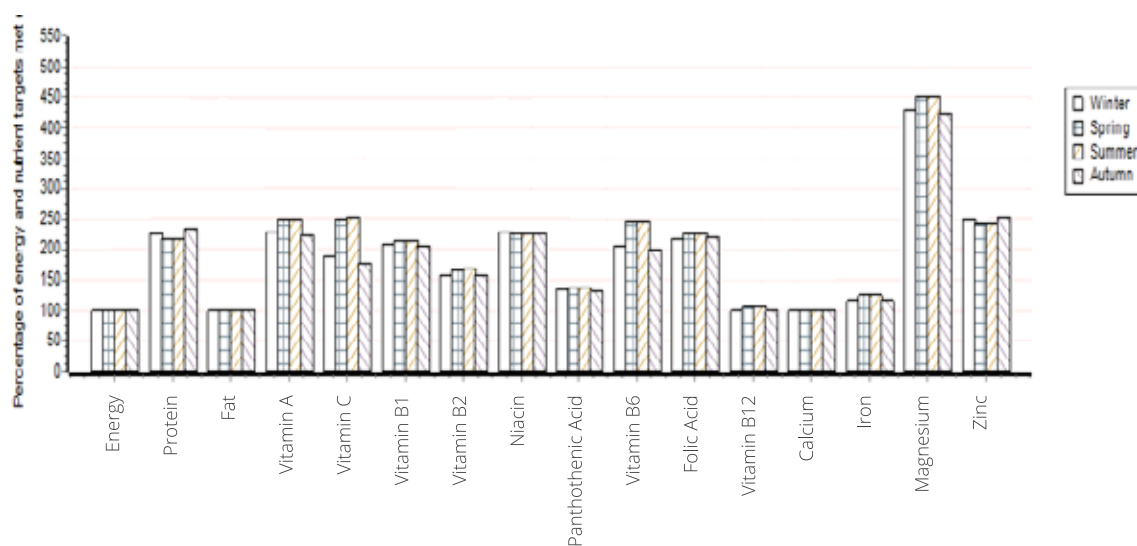
### 3. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Tank Livestock/Poultry livelihood zone



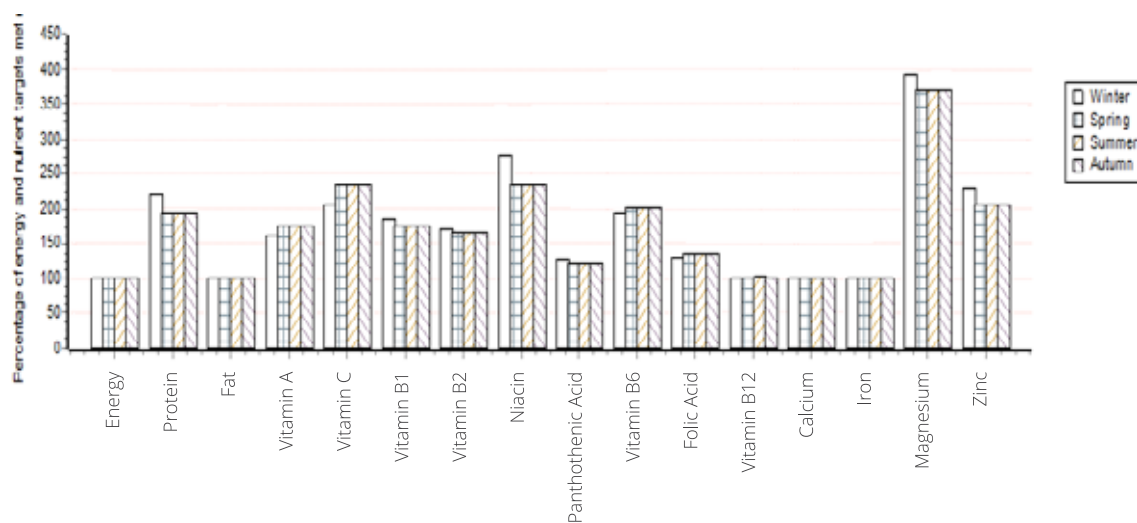
### 4. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Islamabad paid/unpaid livelihood zone in Islamabad



5. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Faisalabad agriculture livelihood zone

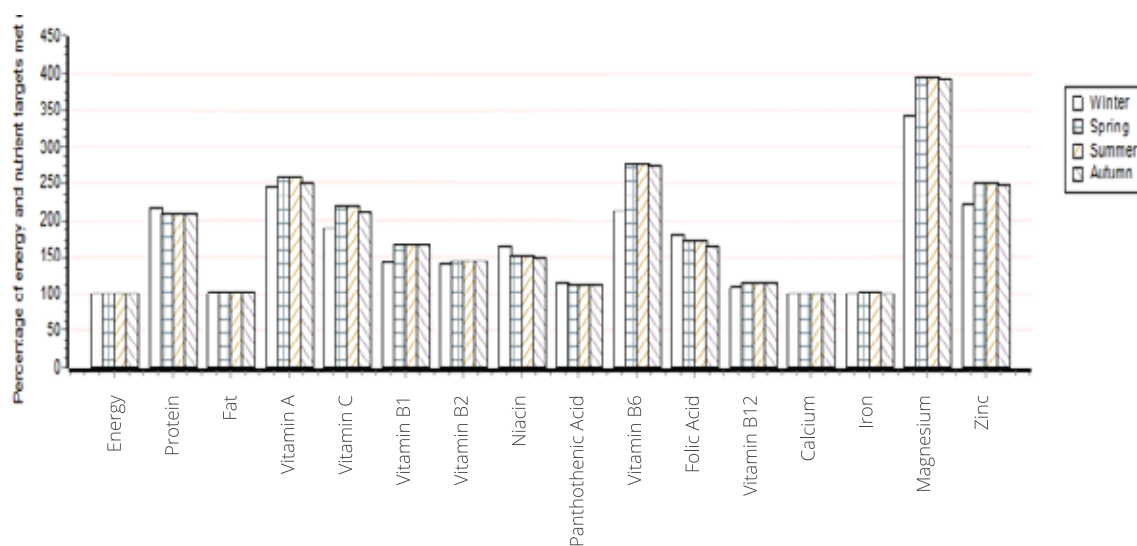


6. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Rajanpur agriculture livelihood zone

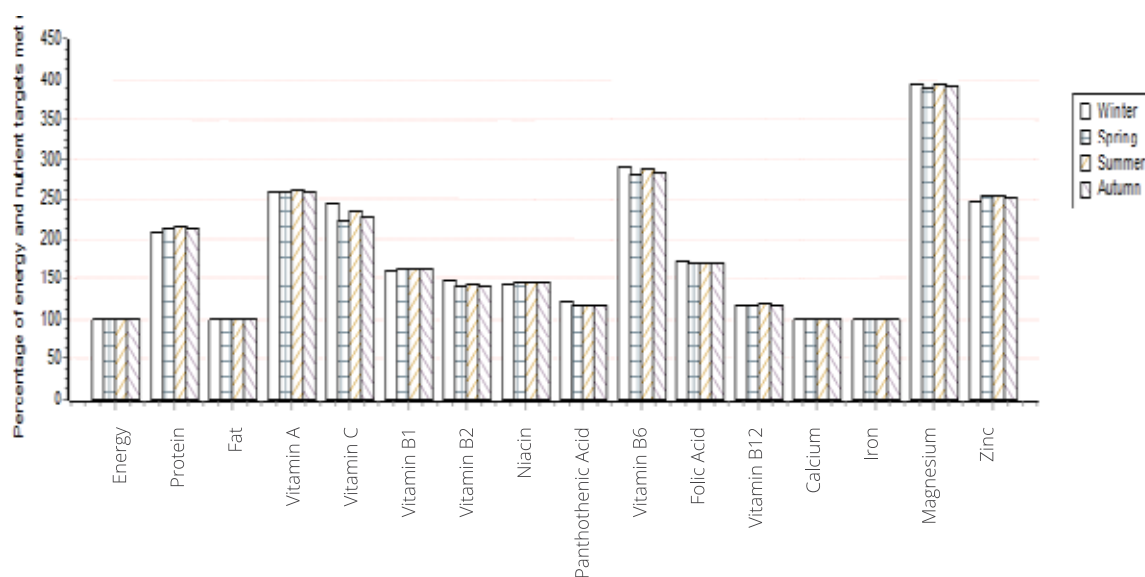




**7. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Haveli agriculture livelihood zone**



**8. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Haveli Livestock/Poultry livelihood zone**



9. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Loralai agriculture livelihood zone

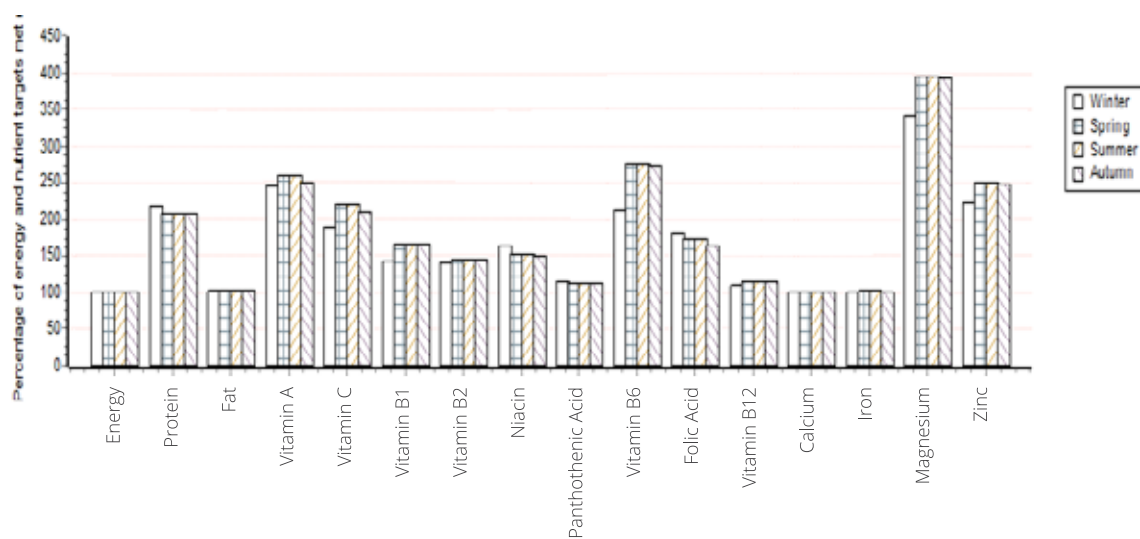
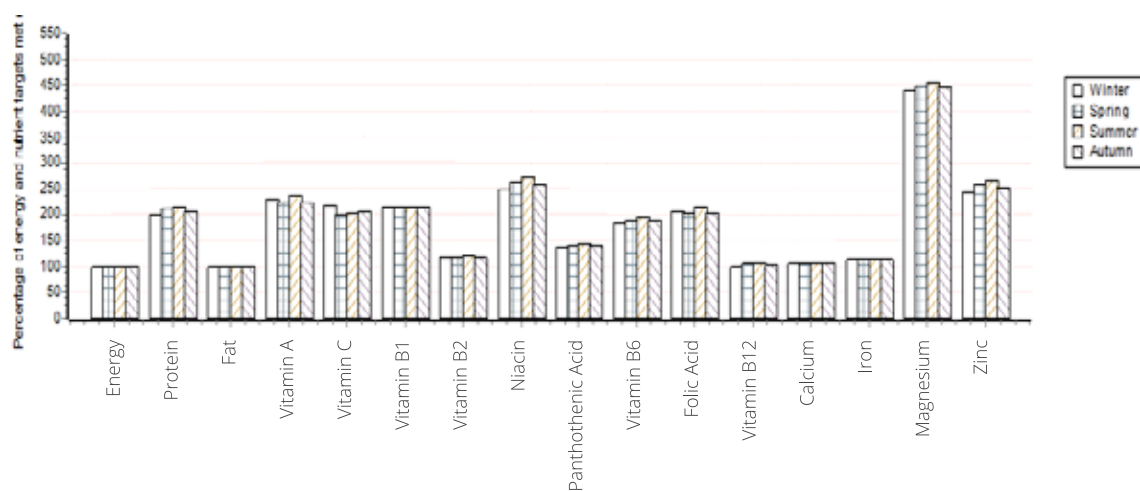
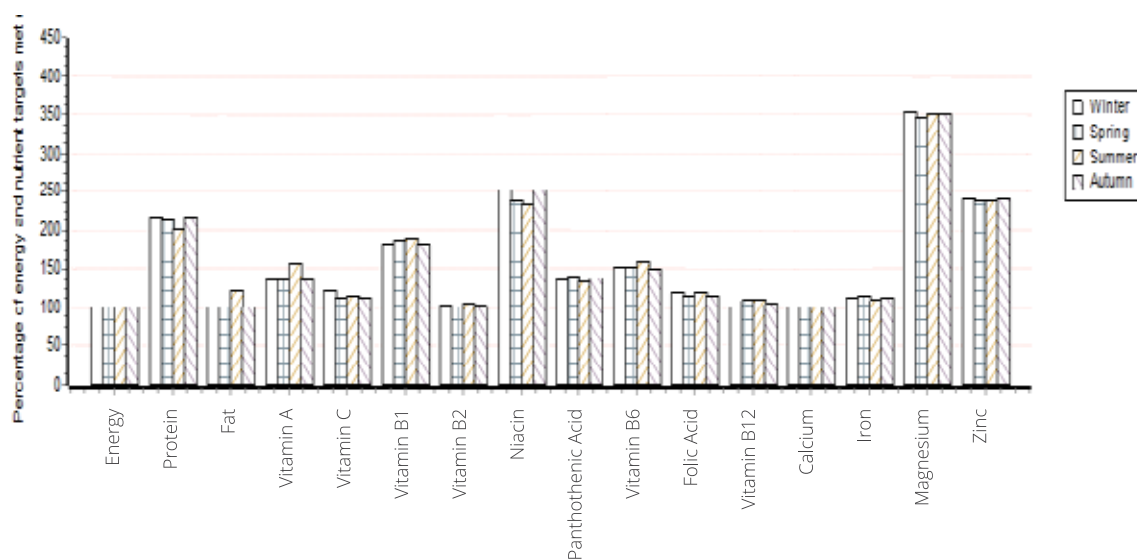


Figure 3.10.3. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Naseerabad agriculture livelihood zone



### 11. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Jacobabad agriculture livelihood zone



### 12. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Sanghar Agriculture livelihood zone

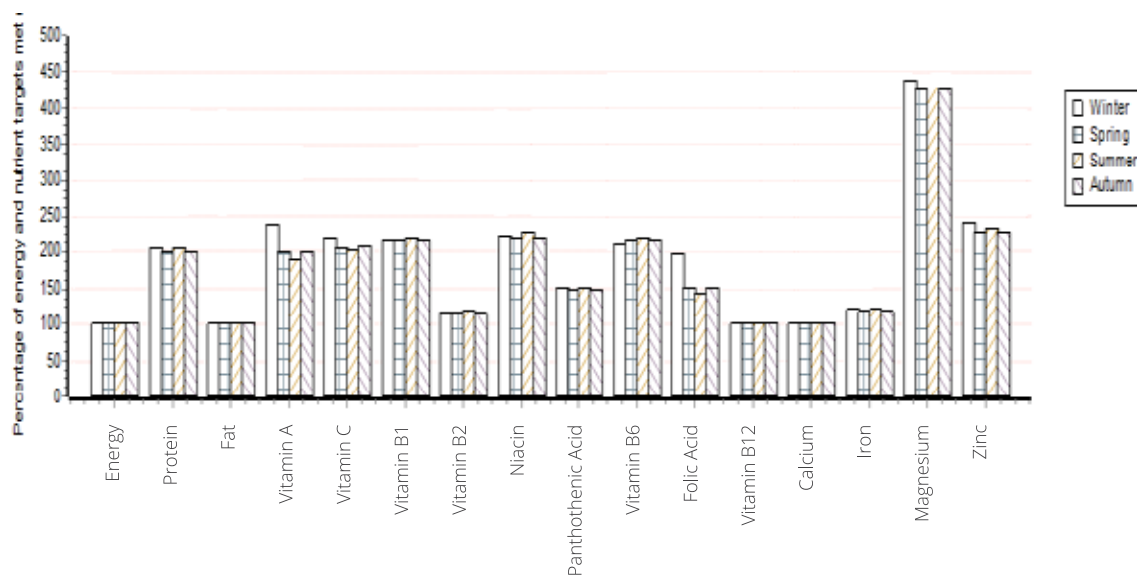


Figure 3.13.3. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Sanghar Livestock/Poultry livelihood zone

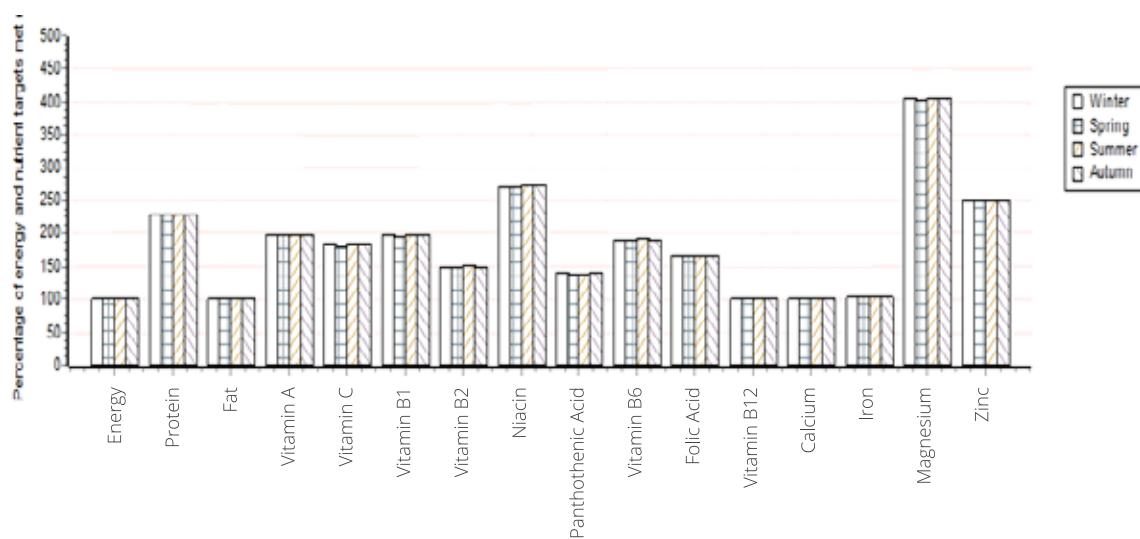
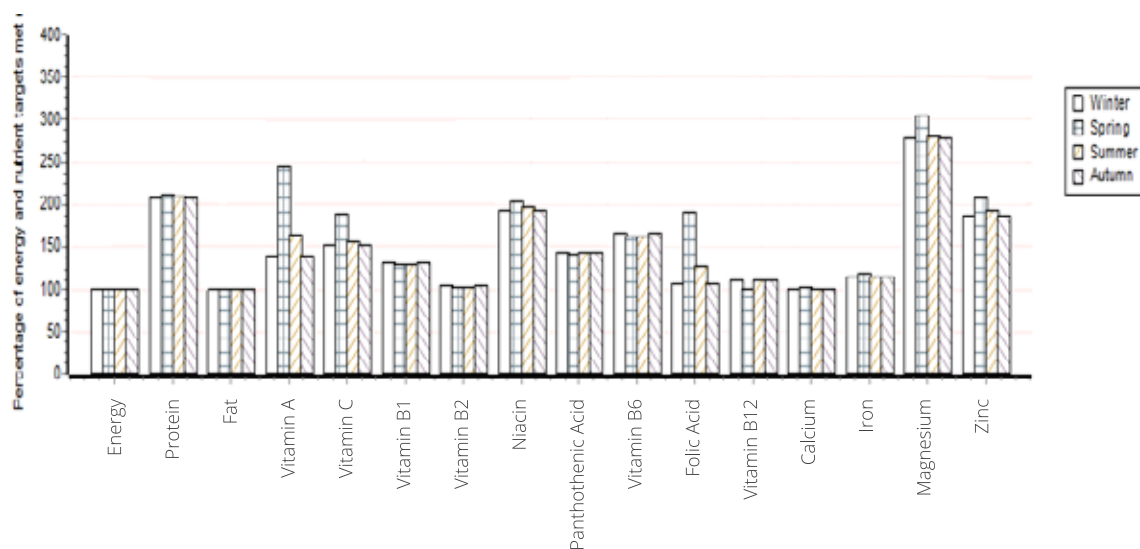
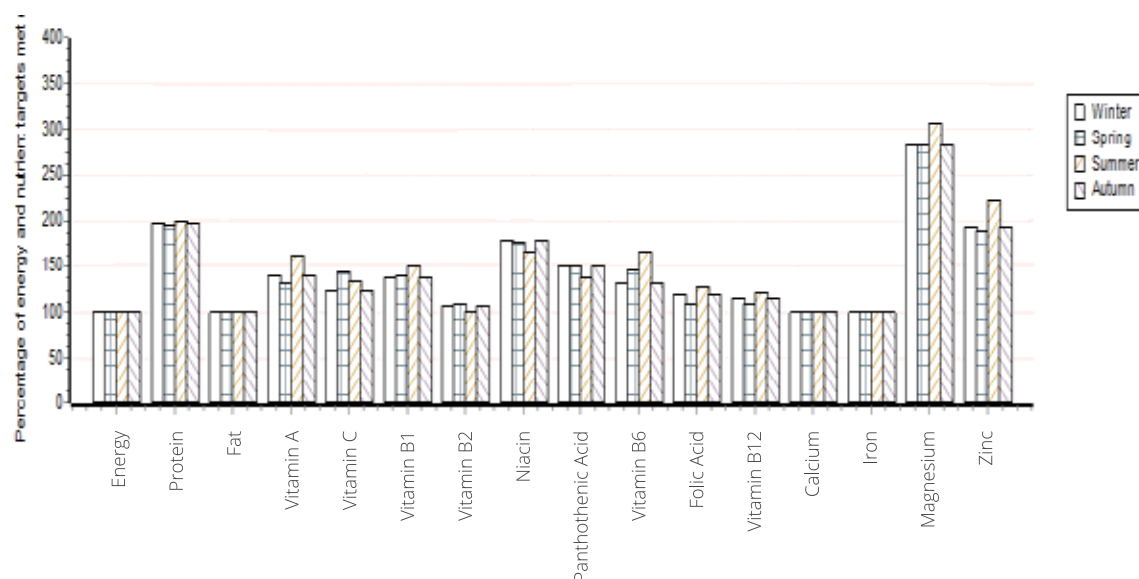


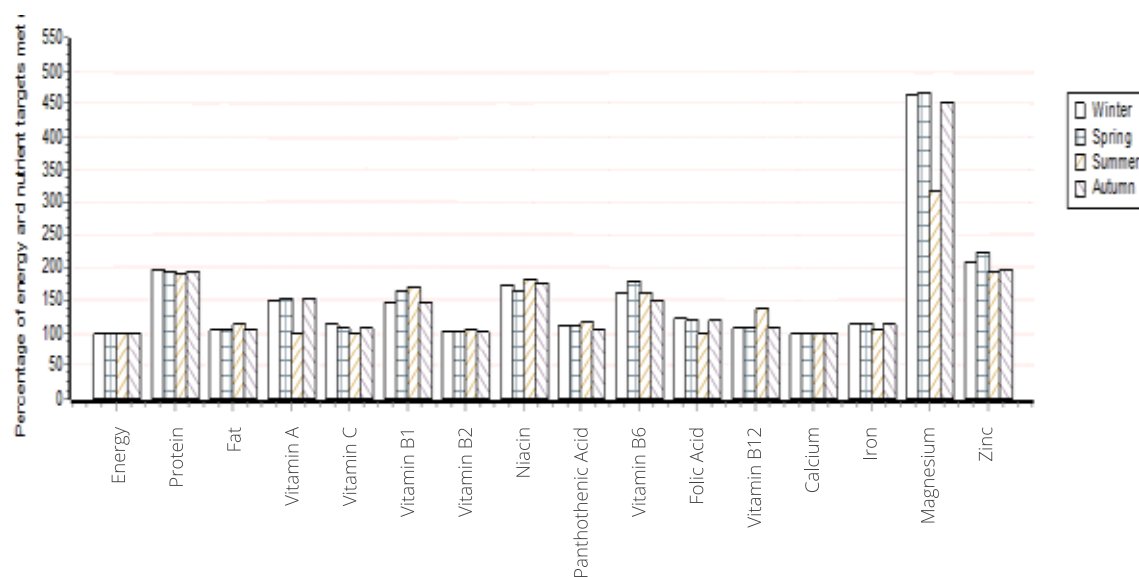
Figure 3.14.3. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Gilgit agriculture livelihood zone



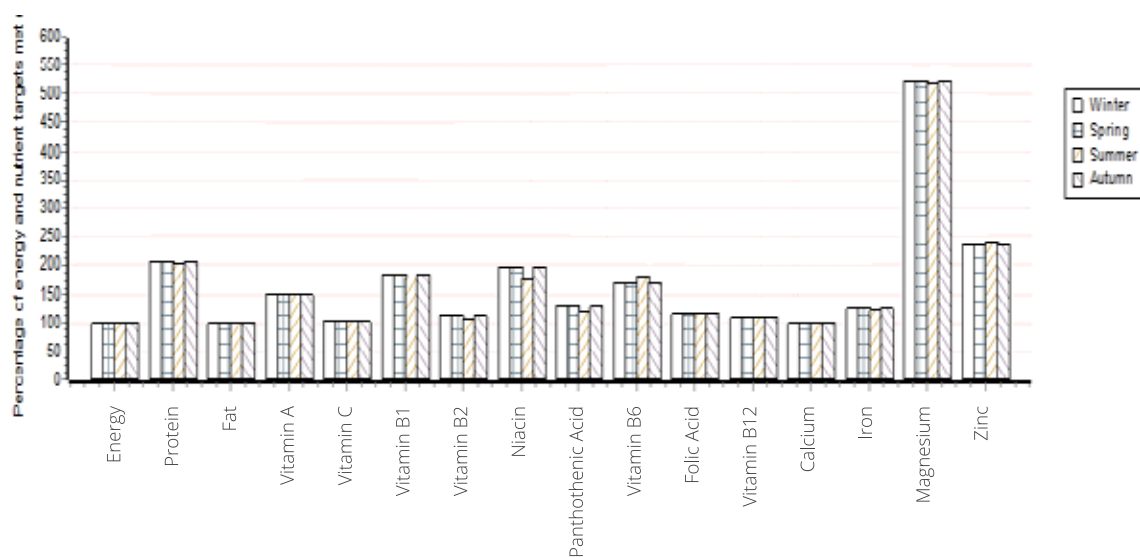
**15. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Gilgit Livestock/Poultry livelihood zone**



**Figure 3.16.3. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Khyber Agency Agriculture livelihood zone**

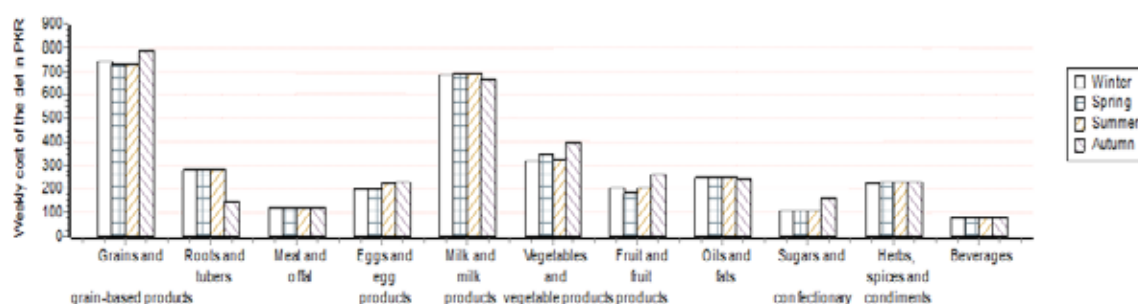


17. The percentage of energy and target nutrient intakes met in a food habits nutritious diet for the family, by season in Khyber Agency Paid/Unpaid livelihood zone

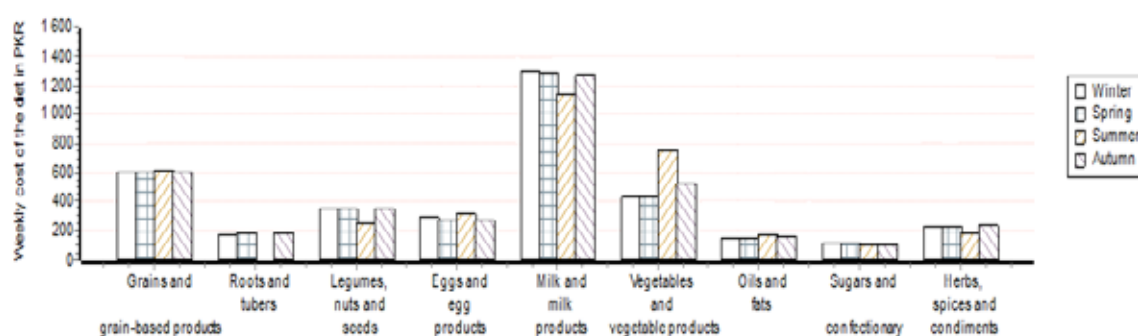


Annex 2.7. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family

1. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Charsadda livestock/poultry livelihood zone.

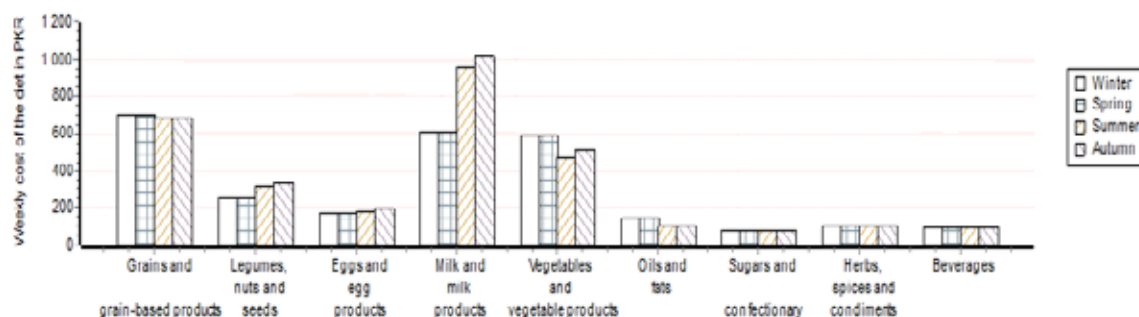


2. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Tank agriculture livelihood zone.

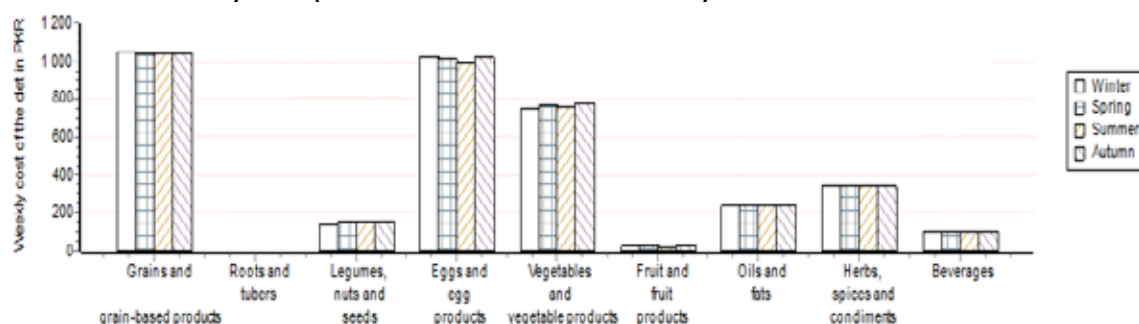




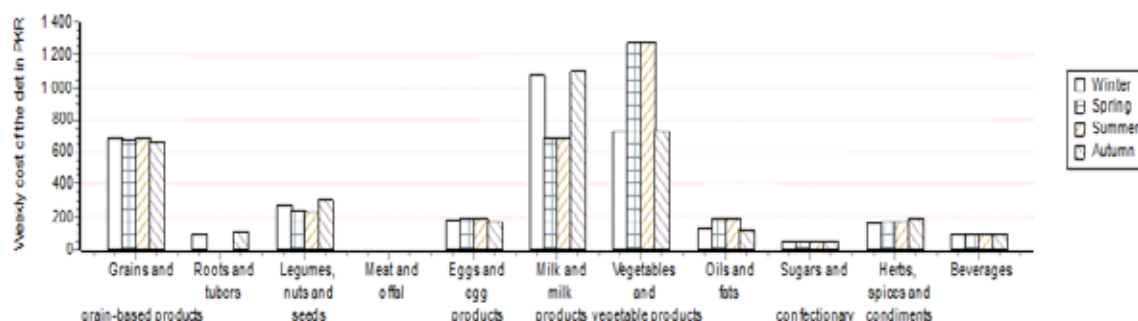
3. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Tank Livestock/Poultry livelihood zone.



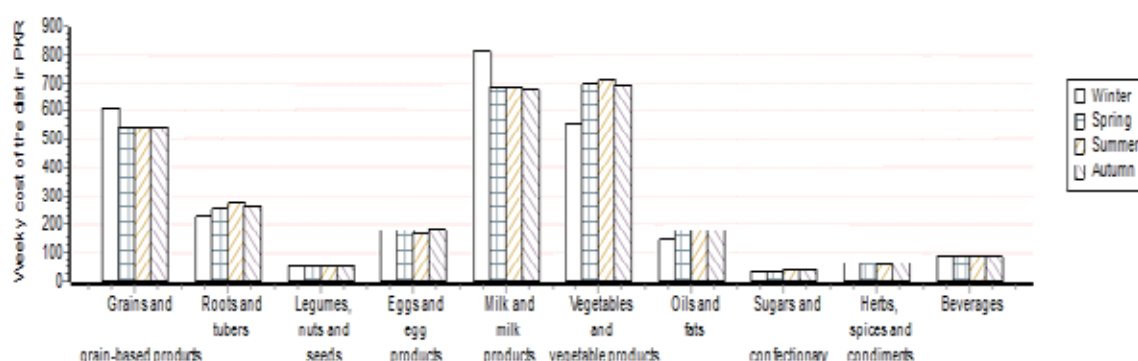
4. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Islamabad



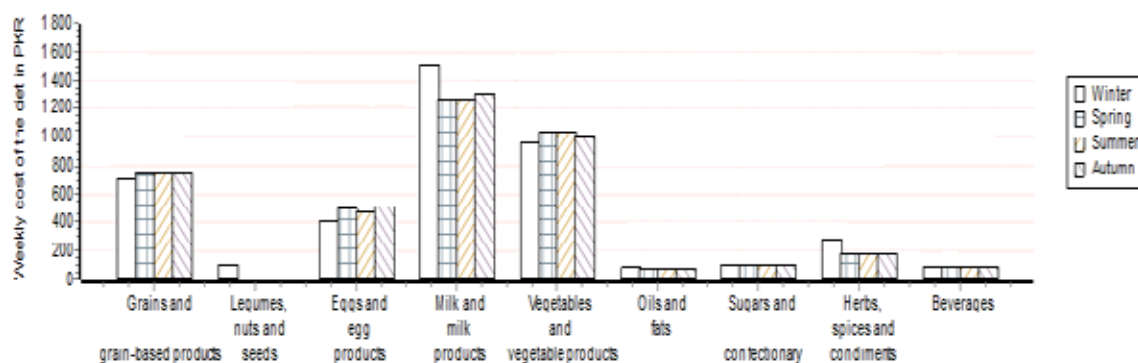
5. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Faisalabad agriculture livelihood zone.



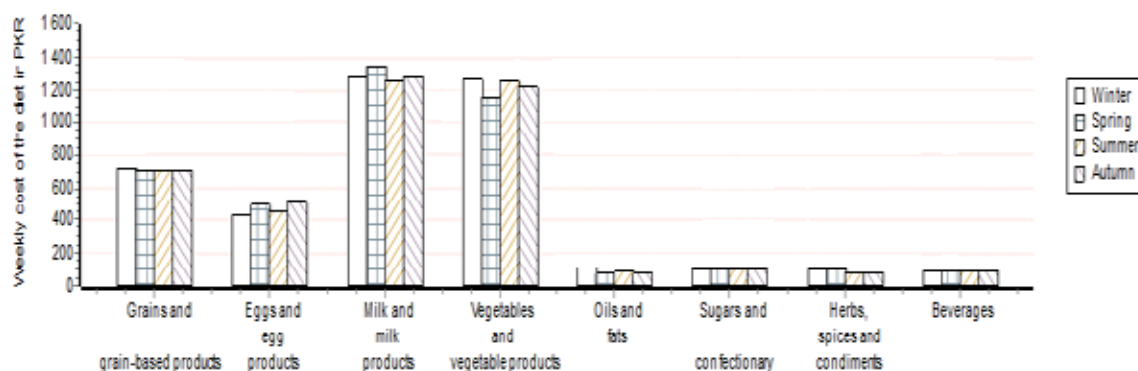
6. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Rajanpur agriculture livelihood zone.



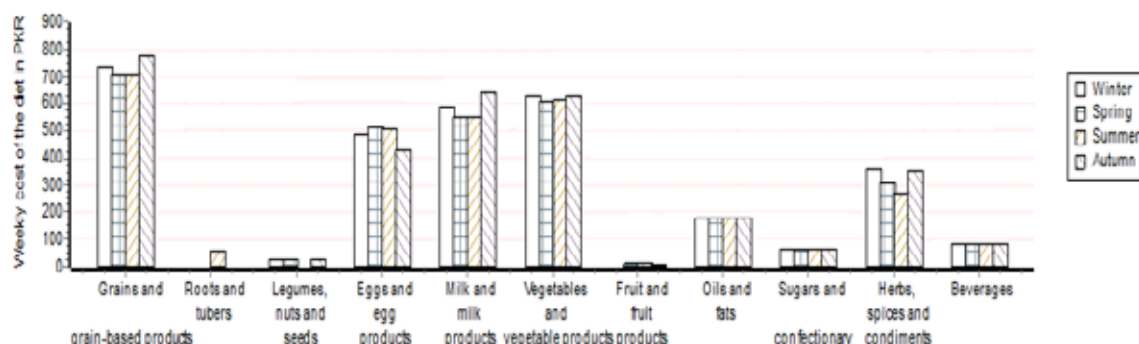
7. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Haveli agriculture livelihood zone.



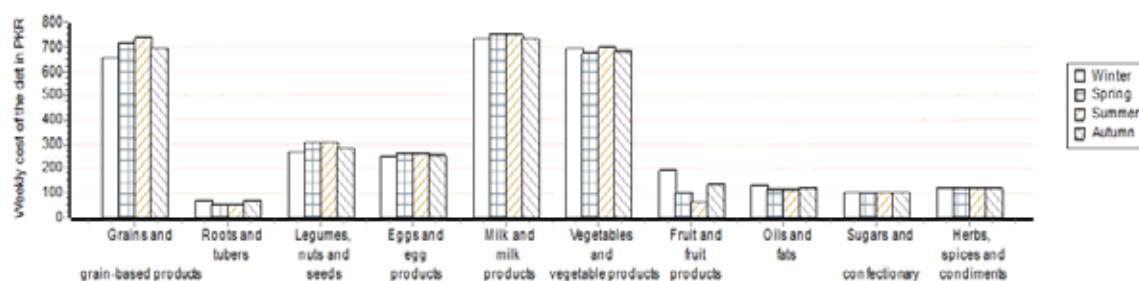
8. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Haveli Livestock/Poultry livelihood zone.



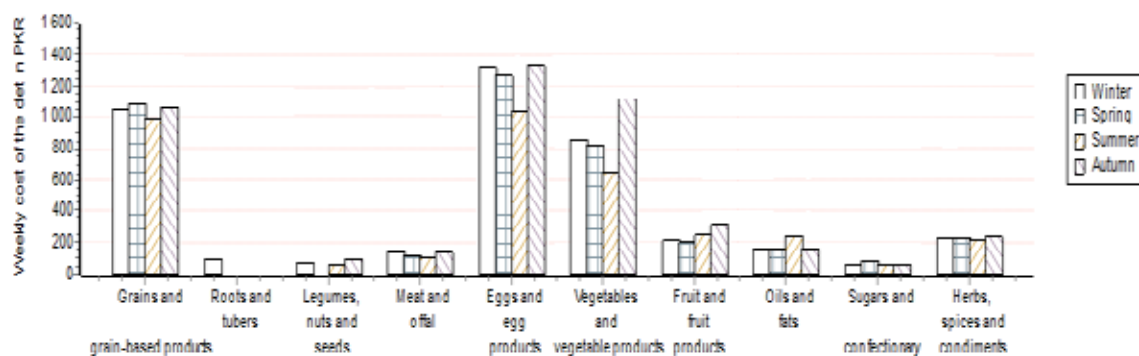
9. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Loralai agriculture livelihood zone.



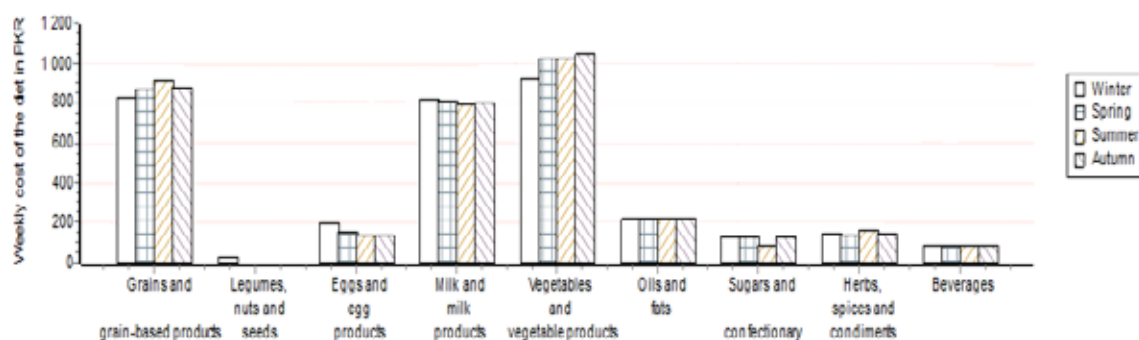
10. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Naseerabad agriculture livelihood zone.



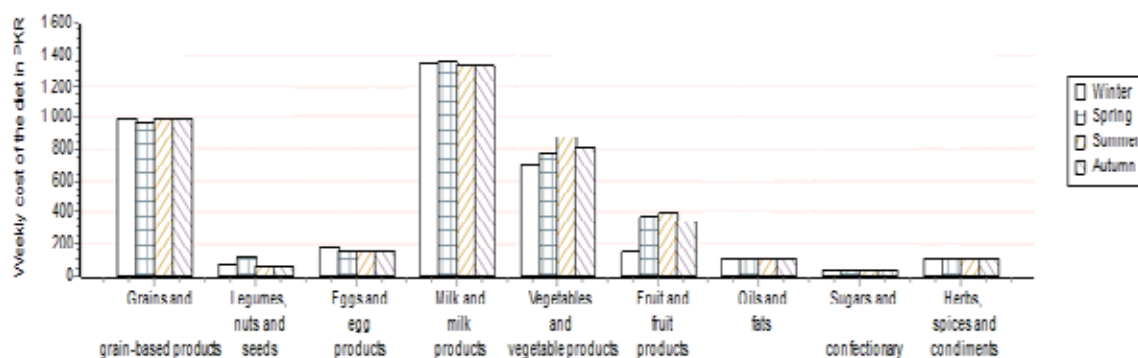
11. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Jacobabad agriculture livelihood zone.



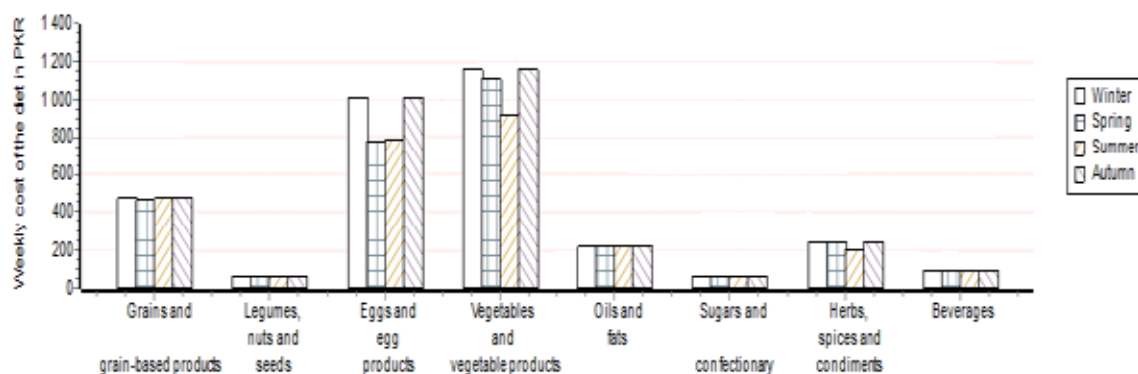
12. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Sanghar Agriculture livelihood zone.



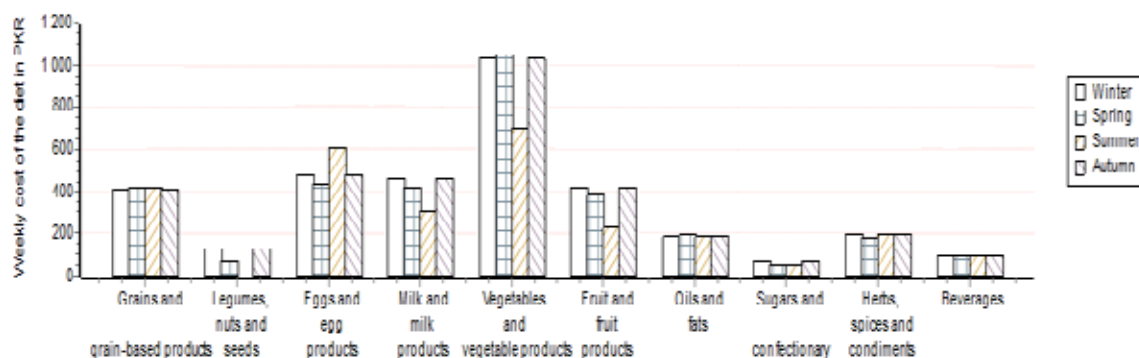
13. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Sanghar Livestock/Poultry livelihood zone.



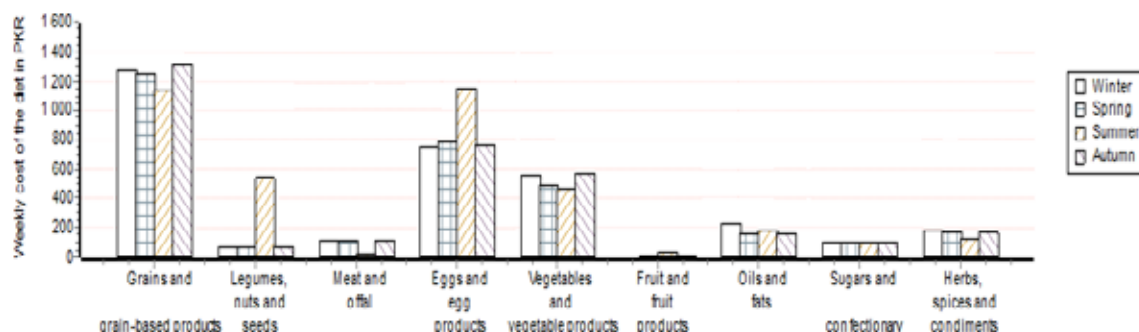
14. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Gilgit agriculture livelihood zone.



15. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Gilgit Livestock/Poultry livelihood zone.



16. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Khyber Agency Agriculture livelihood zone.





17. The weekly food group cost selected by the Cost of the Diet software for the food habits diet that meets needs for macro and micronutrients in a culturally-acceptable diet for the CotD family in Khyber Agency Paid/Unpaid livelihood zone.

