GUIDELINES

NUTRITIONALLY BALANCED RATION PACKAGES

IN EMERGENCIES

NUTRITION INTERNATIONAL

Nourish Life

Scaling Up NUTRITION

Civil Society Alliance Pakistan

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Foreword

According to the Universal Declaration of Human Rights (UDHR) Article 25(1), "everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food…". In emergency contexts, it is important to reaffirm the fundamental right of everyone to have access to adequate and safe food. The Humanitarian Charter and the Minimum Standards (1998)1 aim to quantify people's requirements for water and sanitation, food and nutrition, shelter, and health care.

In emergency situations - whether manmade like war and conflicts or natural like floods, droughts, earthquakes or pandemic outbreaks – where populations are dependent on food assistance, an "adequate food ration" meets the population's minimum energy, protein and fat requirements for survival and light physical activity. An adequate food ration is also nutritionally balanced, diversified, culturally acceptable, fit for human consumption and suitable for all sub-groups of the population.

The current COVID-19 pandemic has affected the socio-economic status of millions of people around the globe and increased the food insecurity of affected populations manifolds. A preliminary estimate suggested that that the COVID-19 pandemic may add between 83 and 132 million people to the total number of undernourished in the world in 2020, depending on the economic growth scenario[1].

Pakistan was facing huge burden of malnutrition, pre-COVID-19, 37% of the households were food insecure and more than 50% of women and children were suffering from multiple micronutrient deficiencies. COVID pandemic has affected multiple aspects of our food system. The economic slowdown has affected poorer communities disproportionately, limiting access to adequate, safe, and nutritious food for households. Severe Food Insecurity in the country has increased to 10% during COVID period as compared to approximately 3% reported in 2018-19. While 30% of the households reported, Moderate Food Insecurity as compared to 13% reported in 2018-19.[2]

There has been large scale ration distribution by Government, civil society organizations, private sector, and philanthropists during the COVID-19 related lockdowns in Pakistan. Mostly, the food basket/ ration package distributed in emergency situations in Pakistan are geared to fulfil the caloric needs or energy requirement of individuals. Generally, these ration packages lack diversification and adequate nutrients.

Keeping in view the country's dismal nutritional status, importance of nutrition for reliance building and rehabilitation and non-availability of any guidelines for making nutritionally balanced ration packages for emergencies in the local context, Scaling Up Nutrition Civil Society Alliance (SUNCSA) Pakistan has developed this document to assist stakeholders working in emergencies and humanitarian settings. This guideline is aimed to serve as a resource and reference for putting together nutritionally balanced ration bags/ food basket for distribution to vulnerable communities.

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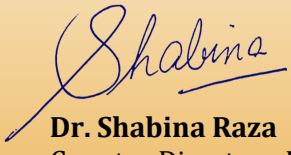

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[1] http://www.fao.org/3/ca9692en/online/ca9692en.html
[2] https://www.pbs.gov.pk/sites/default/files//other/covid/Final_Report_for_Covid_Survey_0.pdf

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Context

In emergency situations such as earth quakes, geopolitical conflicts, any other natural hazards, population displacement and pandemics like COVID-19 often have a serious impact on the health and nutritional status of the affected population. This also depends on the overall health and socioeconomic status of the community and such burdens increase the mortality and morbidity and slows done the economic recovery due to the disaster (1). Food supply needs to be adequate for overall nutritional needs of the population in order to have adequate quantity, quality and nutrition for the vulnerable population. During pandemic & emergency situations, the displaced populations need adequate food assistance to meet the population's optimum needs in terms of energy, protein, fat, vitamins and minerals for daily activities and survival (2). According to the WHO and UNICEF millions of people are suffering from deficiency of food and ration and these statistics were before the COVID-19 pandemic and the situation has worsened since then (3, 4). The assessment of pandemic showed that more that 130 million people will be affected with undernutrition due to the pandemic and the numbers can raise exponentially if the pandemic continues.

The world economy, especially the LMIC (Low- & Middle-Income Countries) including Pakistan, where the economy is frail and more than 40% of the population is living below the poverty line, are at risk of hunger and malnutrition. Furthermore, one quarter of the population experience moderate to severe malnutrition and more vulnerable population are children, elderly, pregnant and lactating women. The lockdown and disruption of food leads to decrease health and more susceptibility to infections. Pakistan is ranked 78 out of 113 countries for food quality and availability and the pandemic has worsened the already weakened situation where the country is struggling to achieve the sustainable development goal of ending hunger (1).

Therefore, in such situation the provision of food and ration to the affected population is of utmost importance. However, to make the packages nutritionally sufficient in all nutrients essential for health is the need of the day. Therefore, such evidence based quick guide is essential to be used in such situations by different government and non-government organizations in the local context and will provide nutritionally balanced ration to the affected population.

Objectives

- To develop brief guidelines for making nutritionally balanced ration packages, which can be used in emergency situations.
- The guidelines will address the nutritional needs of different age groups i.e., infant & young children (up to 2 years), children under 5 years of age, pregnant & lactating women and old age people (above 60 years).

Purpose of the Guideline

In emergency situations like earthquakes, droughts, floods or the present COVID-19 pandemic; the unemployment and peoples' purchasing power has tremendously decreased. The importance of safeguarding food security and nutrition is critical particularly in times of emergency like the current COVID-19 pandemic, when unemployment/layoff from work is on rise, basic health care services & welfare programs are disrupted along with the interruption of global supply chains (2). In times of crises; delivery of basic ration packages/food items to affected population is common practice in many societies. This is done to address the immediate needs of the masses, however, no care is taken in supply of the nutritional status of the items provided. Healthy nutrition is the essential component which is mostly ignored in GFD due to lack of awareness, non-availability of relevant information and there is no guidance in local context and availability of the products.

This document will provide an introduction to the principles of the nutrition that are needed for optimal health of the community. In addition, this document will provide the ration packages for a household that can be used as reference and can be used in emergencies situations. The items provided will be guided in local context and easily available locally for the governmental/non-governmental/private sector for immediate use if there is any disaster. Furthermore, the document will provide insight and quick overview of the needs of the different vulnerable population such as children, pregnant ladies and the elderly population. The document is also providing the additions needed in the ration packages for these vulnerable population for immediate use. This brief and simple guideline for 'Nutritionally Balanced Ration Packages for Emergences', will serve a ready resource for Civil Society Organizations as well as government and other relevant agencies to make their ration/food packages nutritionally balanced.

General Food Distribution (GFD)

GFD is the term used for food rations that are given out to selected households affected by an emergency. The food ration consists of a number of items where the minimum is cereal, pulses and oil. However, other items such as salt, sugar, fresh vegetables, canned meat or fish can be added to make it more nutritionally dense. The general ration is normally delivered as a food basket/package for a duration of 30 days to a standard family of 5 members and modifiable according to the available statistics/population. There are two primary systems for distributing of food aid to the general population during emergencies

- Take home rations
- Large scale cooked food distribution

In addition, there are other forms of GFD distribution but are less common such as:

- Food-for-Work
- Voucher programs (for which voucher reimbursement system has to be established locally)

The most important aspect of GDF is the timely distribution of adequate, basic and nutritionally sound ration packages.

Assessment of Food Needs

There may be multiple causes of food insecurity during the time of emergencies. For example, environmental hazards such as drought, floods, famines etc. or they may be due to socio-political conflicts including internally displaced, refugees, and war conflicts. The most recent cause is the epidemic and pandemic such as COVID-19 for the low socioeconomic groups. The nutritional assessment differs with the situation of the conflict and also depending upon the demographics and severity of the emergency. Nutritional outcomes can be measured as a current physical distress as reflected by the nutritional status beforehand of the communities.

Vulnerable groups such as the pregnant women, malnourished children, elderly and handicapped etc. may be at risk of malnutrition even if household food security is deemed to be sufficient. Furthermore, the need assessment may be done before the provision of the actual food ration provided. The nutritional needs of the targeted population depend upon the following:

- Whether food assistance is needed? Is there a real shortage of food commodities?
- How much is needed and what types of food?
- Who needs food assistance and for how long the assistance needs to be maintained?
- Assessment of the locally available resources and availability of long-lasting food commodities.

Ration planning for General Food Distribution

There are two stages for calculating food aid requirements for the population. The initial calculation of food aid requirements should be made on the basis of need for the population affected and not the availability of resources. The ration planning involves two stages.

- **First stage:** To establish the energy requirements for different groups of the vulnerable population.
- **Second Stage:** To select the quantity and type of food commodities to be included in the ration or 'food basket'.

First Stage: Estimation of Energy Requirements

The energy requirement of the population in need is referred to as the 'mean per capita energy requirement' for that particular population that is affected. This is calculated by taking weight average requirements for each age and sex group. The average daily energy requirement for healthy adult is calculated to be 2100 kcal/person/day. The complete ration including the above-mentioned energy requirement should be based on the following calculations:

- 10-12 % of total kilocalories provided by protein in the ration
- 17 % of total kilocalories provided by dietary fats
- Adequate micronutrient intake should be added

However, 2100 kcal/person/day does not meet the energy and nutrition needs of 'special' groups such as pregnant and lactating women, malnourished children, and people suffering from certain illnesses who need higher energy and nutrition requirements. Keeping these in mind ICRC recommends ration of 2400 kcal/person/day. The working figure of 2100 kcal may be adjusted for the following reasons when calculating the food baskets/ration packages:

1) **Age and structure of the population:** A population of exclusively children and women will require 6% less energy as compared to the standard population. If predominantly male population is more than there is 6% increase in daily energy requirements.

2) **Nutrition and health status of the population:** When the nutritional status of the population is poor extremely (crude mortality rate CMR is significantly elevated) an additional 100-200kcal should be added to the basic ration.

3) **Physical activity levels:** If the population is involved in more than light activity the ration should be increased accordingly:

    - Moderate activity (e.g., walking short/medium distances)
    - Adult males: Add 360 kcal to the standard requirement
    - Adult females: Add 100 kcal to the standard requirement
    - Whole population (adults and children): Add 140 kcal to the standard

4) **Environmental temperature:** The energy demand of the body increases as environmental temperature falls. For every 5 ºC drop below 20 ºC, an additional 100 kcal/day/person should be provided. For example: if temperature is 15 ºC, an additional 100kcal/person/day of energy needs to be added to the daily requirement. If temperature is 10 ºC, then additional 200kcal/person/day should be added to the food basket.

5) **Access to alternative food sources.**

6) **Pregnant and lactating women:** During pregnancy and lactation, women's nutritional needs for energy, protein and micronutrients significantly increase due to increase in the metabolism and demand of the fetus/offspring. The extra energy is utilized for the optimal growth and nutrition of the fetus. Therefore, these ladies will require an extra amount accordingly:

   - Pregnant women require an additional 285 kcals/day
   - Lactating women require an additional 500 kcals/day.

7) **Older Persons (Over Age of 60):** The energy requirements for older persons usually decrease as a result of less physical activity and decreased basal metabolism. However, the requirements for micronutrients, do not decrease rather increase with aging as the body cannot utilize the usual amount and needs additional amounts for optimal health. Hence, an adequate diet for older persons must ensure that micronutrient requirements are still met even with reduced energy intakes.

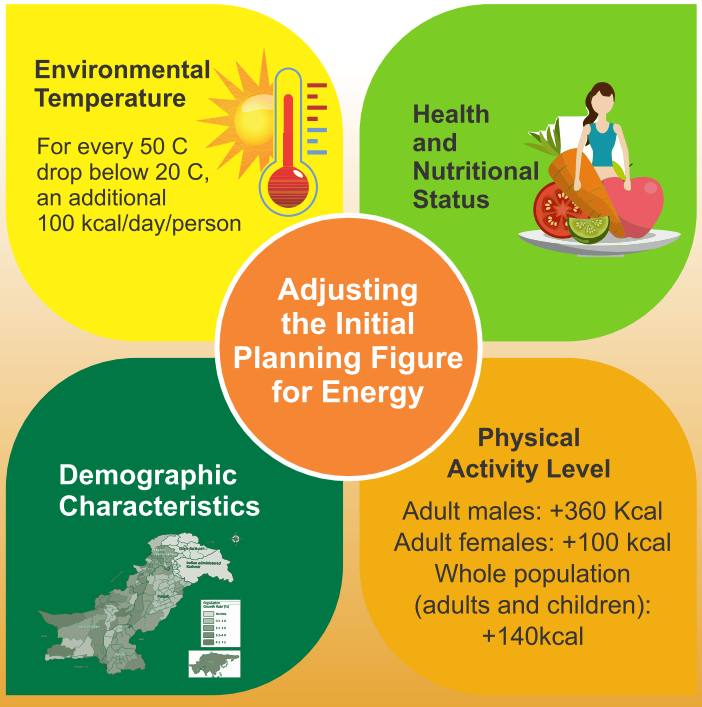
   Therefore, older persons, or families including older persons, should be provided with blended foods, where the food can be easily digested by the elderly, along with increase number of micronutrients in form of supplement.

8) **Children under 5 years of age.**

9) **Increasing the duration of assistance from 30 to 35 days:** If the duration of assistance needs to be increased from 30 to 35 days for a family, then in that case add approximately 300 kcal requirements per day to the food basket (300kcal are approximately 14%) in order to meet the requirements of the extra 5 days.

10) **Increasing the size household from 5 to 6:** If the number of individuals is increased in the household then the requirements would increase. As the ration of 5 persons when used by family of 6 would compromise the energy needs by approximately 350 kcal. Therefore, approximately 350 Kcal needs to be added to the overall basket size with each addition of person. i.e. 350 kcals (17%) compared to 315,000 total Kcals (2,100 x 5 individuals x 30 days).

Figure 1: Figure showing the summary of adjustment of planning of energy requirements.



Second Stage: Selection of Food Commodities to be Included in Food Basket (Food Basket Design)

With the initial planning figure (2,100 kcal) in mind, food commodities that meet the basic energy, protein, fat and micronutrient requirements of the affected population must first be selected:

Macronutrients	Micronutrient
➨ 45 – 65 % Carbohydrate ➨ 10 – 15 % Protein of Total Energy ➨ % Fat of Total Energy: ● 17 % general population ● 30-40 % children 6-59 months ● 20 % pregnant & lactating women (WHO/WFP/UNHCR, UNICEF, 2002)	➨ Provision of Recommended Nutrient Intake (RNI) of all essential Vitamins and Minerals (Source: WHO/WFP/UNHCR, UNICEF, 2002)

Size and composition of the food basket is tailored in order to meet the following requirements:

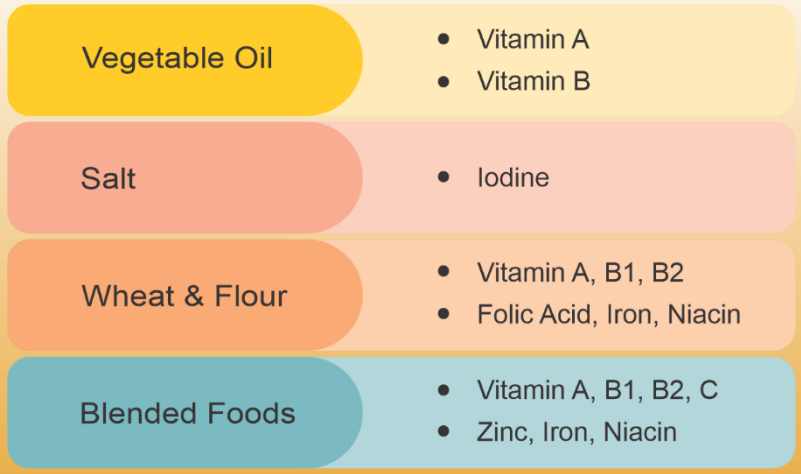
- Local preferences
- Demographic profile
- Activity levels
- Climatic conditions
- Local coping strategy
- Existing levels of malnutrition and disease

Designed to meet the nutritional requirements of a population rather than individuals

Fortification of the Ration with Micronutrients

Different food items need to be fortified for long term storage and to avoid micronutrient deficiencies. Figure 2 shows summary of some commonly used food with fortification.

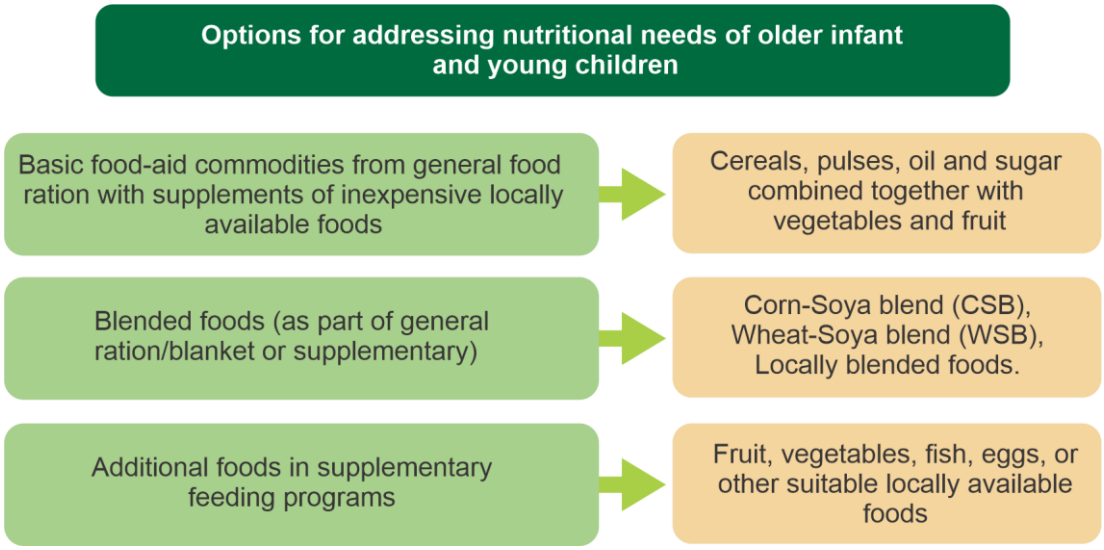
Figure 2: Fortification of different foods items for food ration supply



Complementing the Needs of the Vulnerable Population

Vulnerable population such as children below 5 years and infants needs complementing food for the optimal growth and maintaining good health. Figure 3 summarized the options for complementing the needs of older infants and young children.

Figure 3: Complementing the food for the addressing nutritional needs of older infants and young children



Food Basket Commodities

Food basket commodities should contain the following items for the use by the family.

- Cereal grains
- Legumes/Pulses
- Dried Milk
- Vitamin A & D Fortified Vegetable oil
- Locally available blended food
- Sugar
- Iodized Salt
- Meals ready-to-eat (MREs) or Humanitarian daily rations (HDR)
- Liquid Nutrient Supplements (LNS)

Fortified Blended Foods (FBFs)

They are processed mixtures of cereals and other ingredients that have been milled, blended, and pre-cooked. The protein provided by blended foods includes all the essential amino acids. Fortified blended foods are sometimes used in the general ration, to help provide an additional source of micronutrients. Nutritional specifications of 100 grams of dry blended food should provide 380 kcal, 14 per cent protein, 6 per cent fat and a vitamin and mineral complex. As these FBFs are generally donated by UN organizations like WHO/UNICEF therefore, it has been experienced in the past that these have major acceptability issues in our population. So, food blends like these can be prepared from locally available foods with familiar taste.

Examples:

- Corn Soy Blend (CSB)
- Wheat Soy Blend (WSB)

High Energy Biscuits (HEB) and "BP5"

They are comparable in energy and protein and can be suitable to meet emergency food needs on a temporary basis. When cooking facilities are not in place or unknown or in case of sudden need, compact foods are easy to handle, transport and distribute. It is monotonous to eat daily. As soon as possible normal food should be provided.

Corn Soy Blend Plus (CSB +/++)
It is a reformulation of the original CSB to meet the additional energy density and micronutrient needs of some population subgroups. CSB+ is a product for children two years of age and older, adolescents, pregnant/lactating women, adults and other vulnerable groups such as those with chronic illnesses.

It is a mixture of cereals, soy beans, sugar and a vitamin/mineral mix. CSB++ is a more digestible form of CSB intended for children 6-23 months. In addition to the above-mentioned components, it includes dried skim milk and oil in its formulation and has a higher nutritional value with 410kcal, 16 per cent protein, 9 per cent fat and a vitamin and mineral complex.

Meals ready-to-eat (MREs) or Humanitarian daily rations (HDR)

These rations are the most expensive food aid commodities and are usually reserved for immediate response during the first few days of a sudden disaster or the displacement of large numbers of people.

Liquid Nutrient Supplements (LNS)

LNS products are gaining popularity. All LNS provide a range of vitamins and minerals, but unlike most other multiple micronutrient supplements, LNS also provide energy, protein, and essential fatty acids. RUFs do not require dilution or cooking, are safe to store without refrigeration and risk of contamination is low.

Examples: Locally available ready to use supplement food approved by Government of Pakistan can be added to the basket.

Food Basket

- Food Basket should contain vitamin-rich foods that has long shelf life and supplements (vitamin A, C zinc and iron etc) according to the recommended daily intake can be added.
- Zinc rich food like dried meat and poultry if locally available along with beans, nuts, fortified cereals can be added.
- Vitamin C rich fruits and vegetables like guavas, papayas, mangoes and citrus fruits along with tomatoes and cauliflowers can be added.
- Ginger and garlic can be added not only as taste enhancers but also for their strong antioxidant and natural boost capabilities.

Food Baskets Commodities

The basic food commodities for a family of 5 persons that needs to be put in the ration package/ basket needs to be nutritionally dense. The standard baskets are summarized in table 1 & 2.

If needed and extra amount is available the following items can be added such as seasonal fresh vegetable and fruits, eggs and meat. Furthermore, soap, washing powder, antiseptic solution, tooth paste, Sanitizers etc. can be added. If the number of family members are increased than according the amount needs to be further increased per addition of each person.

Table 1: Standard basket 1 for a family of 5 adults for a duration of 30 days.

Food Item	Weight/Quantity
Wheat flour (fortified)	25 Kg
Rice (cost effective variety)	20 Kg
Chickpeas/Pulses/Beans/Legumes	5 Kg
Potatoes/Sweet potatoes/Carrots/Turnips/root vegetables	5 Kg
Onions	5 Kg
Semolina (Suji)	2.5 Kg
Sugar	5 Kg
Vitamin A& D fortified Cooking Oil	5 Liters
Peanuts/Nuts	2 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Ginger/Garlic	0.5 Kg
Green/Red Chilies	0.5 Kg
Dried Fig/Dates	1 Kg
Milk Powder*	2 Kg

*Milk Powder should be used for tea and not used as substitute for breast milk for infants and children

Table 2: Standard Basket 2 for a family of 5 adults for a duration of 30 days

Food Item	Weight/Quantity
Wheat flour (Fortified)	20 Kg
Maize Flour (Makai atta)/Basin	5 Kg
Rice (Cost effective variety)	10 Kg
Chickpeas/Pulses/Beans	5 Kg
Potatoes/onions/carrots/other root vegetables	5 Kg
Panjeeri	1 Kg
Semolina	2.5 Kg
Sugar	2 Kg
Vitamin A & D fortified Cooking Oil	5 Liters
Mixed Dry fruit	1 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Milk Powder*	2 Kg
Ginger/Garlic	0.5 Kg
Porridge/Dalya	2.5 Kg
Qulchay/Amrasay/local snacks	2.5 Kg

*Milk Powder should be used for tea and not used as substitute for breast milk for infants and children

Nutritional Requirements of Infants & Children

Previously experience has shown that infant and child morbidity and mortality rates often dramatically increase during emergencies. As part of estimating food and nutritional needs, specific interventions are required during emergencies to protect and promote optimal infant and child-feeding practices. The important aspects to be kept in mind are the breast feeding, weaning and complementary feeding to children.

Breastfeeding

Breast milk is the ideal food for healthy growth and development of infants and young children. The availability of nutrients from breast milk exceeds that from any other substitute. Breast milk not only provides all the nutrient requirements for healthy growth of infants but also protects children from infections. It also decreases needs for hospitalization, promotes family planning and saves money.

Breastfeeding in Emergencies

In most emergencies, breastfeeding becomes even more important for infant nutrition and health. The resources needed for safe artificial feeding such as water, fuel and adequate quantities of infant formula are usually scarce in emergencies. Artificial feeding in these circumstances increases the risk of diarrheal diseases and malnutrition, which in turn substantially increases the risk of infant morbidity and mortality.

Principles for Feeding Infants During Emergencies

All infants, including those born into populations affected by emergencies should normally be exclusively breastfed for the first six months. The beneficial effects of colostrum in breast milk are especially important in the immune development of infants. All infants should be breastfed on demand from birth. Every effort should be made to identify ways to breastfeed infants whose mothers are absent or incapacitated. Re-lactation should be attempted before the use of infant formula is considered.

Every effort should be made to create and sustain an environment that encourages exclusive breastfeeding for the first six months, and continued frequent breastfeeding thereafter for up to two years.

The Quantity, Distribution & Use of Breast Milk Substitute

Infant formula at emergency sites should be strictly controlled, using the following guidelines:

- Nutritionally adequate infant formula, fed by cup, should be available for infants who do not have access to breast milk.
- Those responsible for feeding infant formula should be adequately trained and equipped to ensure its safe preparation and use.
- Feeding infant formula to a minority of children should in no way interfere with protecting and promoting breastfeeding for the majority.

- The use of infant feeding bottles and artificial teats in emergency settings should be actively discouraged and cup feeding promoted instead, as cups are much easier to keep clean.
- Frequent on demand feeding is necessary for optimal growth and health.

Complementary Feeding for Older Infants & Young Children

At 6 months of age, infants should start to receive complementary foods in addition to breast milk. During the complementary feeding period, older infants and young children require foods that are easily digestible. Complementary foods used during this period should provide:

a) Fats and oils (30–40 %).
b) Proteins (12%)

These young children must have access to foods rich in micronutrients for sufficient growth and development. The food should be safely prepared from locally available ration that are rich in energy and micronutrients. This is usually a major challenge due to constraints during emergencies. Table 3 below summarizes the nutritional needs of older infants & young children.

Table 3: Summary of nutritional needs with examples of available foods for infants and young children

SOURCE OF FOOD	EXAMPLES OF FOODS	REMARKS
Basic food-aid commodities from general ration with supplements of inexpensive locally available foods	Cereals, pulses, oil and sugar combined together with a variety of vegetables and fruit (cereals and pulses must be prepared using ground or milled forms)	a. Combinations of cereals and pulses with added oil and sugar. b. Recipes can be developed using local foods with input from nutrition and/or health expertise. a. Traditional complementary feeding practices must be observed and understood.
Blended foods (as part of general ration/ blanket or supplementary)	Varieties of locally produced blended foods approved by the government.	a. Blended foods processed by roasting or extrusion to improve digestibility. b. For growth and development, blended foods are usually fortified with zinc, iron and other micronutrients
Additional foods in supplementary feeding program	Fruit, vegetables, fish, eggs or other suitable locally available foods	a. Valuable source of vitamins and minerals b. Prevents from infections and promotes health

Implications for Planning Food Needs for Older Infants & Young Children

Many challenges and issues are usually observed when planning the feeding regimes for infants and children such as the increase energy demand, frequent feeding due to small stomach size and clean healthy food preparations. Some of the issues highlighted with possible solutions are described in the figure 7 below.

Table 4: Summary of implications for planning of food needs for infants & young children

ISSUE	IMPLICATIONS FOR PLANNING FOOD NEEDS
Feeding frequency: Due to limited stomach capacity, food needs to be provided frequently	a. Provision of sufficient fuel and cooking pots for households with young children. b. Supply of food-aid commodities is consistent and timely to facilitate appropriate food-preparation practices. c. Recognition of time required by caregiver for food-preparation activities.
Household food security: Household food security may contribute to intra-household food distribution that does not allow nutritional needs of young children to be met.	a. Adequate and equitable general ration. b. Household monitoring as part of general monitoring system. c. Community-based surveillance to identify problems related to intra-household distribution.
Safe and appropriate food preparation and caring activities: Lack of access to clean water, poor sanitation, inexperienced caregivers and mothers overburdened with meeting household food needs may contribute to abnormal and inadequate caring practices.	a. Health promotion activities for safe food preparation and dissemination of information on nutritional needs of young children. b. Access to adequate amounts of clean water and provision of suitable sanitation facilities.
Feeding of orphans	a. Additional resources to create a special and appropriate system to care for those children, preferably in a family environment.

Nutritional Requirements of Pregnant & Lactating Women

Pregnancy and lactation are normal physiological processes during which women body undergo certain physiological and hormonal changes. During pregnancy and lactation, women's nutritional needs for energy, protein and micronutrients significantly increase as previously described as

- Pregnant women require an additional 285 kcals/day.
- Lactating women require an additional 500 kcals/day.

The increased energy and micro-nutrients requirement during lactation is due to breastfeeding of the infant. The comparison of the increase energy and micronutrient requirement for pregnant and lactating mothers are shown in table 5.

The energy requirements during pregnancy increase mainly due to:

1. Protein synthesis: Protein synthesis primarily occurs in
   - Fetal tissues
   - Placental tissues
   - Uterine tissues
   - Breast tissues
2. Fat tissue synthesis: Most of the fat synthesized during pregnancy is used to:
   - Buildup maternal fat stores
3. Expanded metabolic activity:
   - The energy cost of maintaining an expanding amount of metabolically active tissues. The fetus accounts for about one third of the increased energy needs of the pregnancy.

Designing Food Basket for Pregnant and Lactating Women

With the initial planning figure (2,100 kcal) in mind, food commodities that meet the basic energy, protein, fat and micronutrient requirements of the affected population must first be selected

- 45 – 65 % Carbohydrate
- 15 % Protein of Total Energy
- 20 % Fat of Total Energy
- Micronutrient: Provision of Recommended Nutrient Intake (RNI) of all essential Vitamins and Minerals needs to addressed.

Complementary Interventions to Meet Additional Needs of Pregnant & Lactating Women

1) Fortified Food Commodities

- Provision of a fortified blended food commodities, designed to provide 10–12 percent (up to 15 percent) of energy from protein and 20–25 percent energy from fat.
- The blended food must be fortified to meet two-thirds of daily requirements for all micronutrients, particularly iron, folic acid and vitamin A.
- The food should be provided in addition to the basic general ration.
- Dried or packaged milk with long shelf life can be added. However, these should not be used as substitute of breast milk for infants.
- The food should be targeted to women in their second and third trimesters of pregnancy and during the first six months of the lactating period (i.e. for a total period of at least 12 months)

2) Micronutrient Supplement

- Pregnant women should get daily supplements of
  - Iron (60 Mg/Day)
  - Folic Acid (400 µg/Day)
- Lactating women should get daily supplements of
  - Vitamin A: 400, 000 IU in 2 doses of 200 000 IU in an interval of at least 24 hours within six weeks after delivery
  - Calcium and Vitamin D supplements

3) Drinking Water

- Women are ensured access to sufficient drinking water (extra 1 liter of clean water per day)

4) Malaria Management in Pregnancy

- In areas where malaria is endemic, sulphadoxine-pyrimethamine can be administered through clinics at the beginning of the second and third trimesters.
- Encourage women to use an impregnated bed net during pregnancy.
- Advise women that they must seek immediate medical attention for episodes of fever.

5) Prophylaxis for Management of intestinal Parasites

- Give each affected woman 500 mg mebendazole, in the second and the third trimester

6) Nutrition/Education counselling for Women and Communities

- Counselling of the mother and other family members regarding care during pregnancy for the child and maternal health. Education regarding the physiological changes and increase demand during pregnancy and lactation that women need to know. This will help avoid complications during labor and after birth.

Table 5: Summary of additional macronutrients & micronutrients requirements for pregnant and lactating women

Additional requirements for pregnant & lactating women (per day)		
	Pregnant women	**Lactating mothers**
Total energy(kcal)	285	500
Macronutrients		
Protein (g) Mixed cereal/pulse diet	7.1	18.9 (in first six months)
Energy from fat (%)	At least 20-25 percent of energy should be derived from fats	
Micronutrients		
Vitamin A (µg)	100	350
Vitamin D (µg)	7.5	7.5
Vitamin B1/thiamine (mg)	0.1	0.2
Vitamin B2/riboflavin (mg)	0.1	0.3
Niacin (mg)	1.1	2.7
Folic acid (µg)	250	100
Calcium (g)	0.6	0.7
Iron: low 5-9% (mg)	60-120	17
Iodine (µg)	50	50

Nutritional Requirements of Older Persons

Elderly like the infants are also more prone to be affected during the time of emergencies. Therefore, special care is needed for these vulnerable population. The energy requirements for older persons usually decrease in comparison with younger adults as a result of less physical activity and decreased basal metabolism. The requirements for micronutrients, however, do not decrease. An adequate diet for older persons must ensure that micronutrient requirements are still met even with reduced energy intakes (i.e. sufficiently nutrient-dense). Sufficient intakes of fluids are required to prevent dehydration and improve digestion. The older persons should be given the following priorities:

- Access to easily digestible, micronutrient-rich foods
- Family and community support for food preparation
- They should be provided with blended foods
- Access to milling facilities in situations where whole-grain cereal is provided
- Access to easily digestible, micronutrient-rich foods
- Older persons (caregivers/families) should be assisted and encouraged in small-scale horticultural activities to increase consumption of fresh foods.
- Family & community support for food preparation

Older persons, without family or community support, can be assisted through community-based support programs. Assistance with tasks such as collection of rations, food preparation and collection of water may be required for older persons. The summary of the food requirement for the elderly is shown in the table 6.

Table 6: Summary of additional requirement for older population with sources of food

SOURCE OF FOOD	EXAMPLES OF FOODS	REMARKS
Blended foods (as part of general ration/ blanket or supplementary)	Varieties of locally produced blended foods	a. Blended foods processed by roasting or extrusion to improve digestibility. b. For growth and development, blended foods are usually fortified with zinc and iron and other micronutrients
Additional foods	Fruit, vegetables, eggs or other suitable locally available foods	a. Valuable source of vitamins and minerals
Basic food-aid commodities from general ration with supplements of inexpensive locally available foods	Cereals, pulses, oil and sugar combined together with a variety of vegetables and fruit (cereals and pulses must be prepared using ground or milled forms)	a. Combinations of cereals and pulses. b. Recipes can be developed using local foods with input from nutrition and/or health expertise.

Food Basket to Prevent Micronutrient Malnutrition

- Food rations often only composed of a few commodities, so it is important to select them well to address the main deficiencies.
  - Example: ground nuts are often added in food rations where pellagra is prevalent because they are rich in **vitamin B3**.

- **Vitamin A:** carrots, Vitamin A fortified oil, papaya, melon, animal foods -adding 25g of fish or chicken liver provides more than RNI amount/day. Dried apricot can be added.

- **Vitamin C:** found in most fruits, spinach, tomatoes, any citrus fruit, green chili, peppers, guavaetc can be added to the ration. In addition, Vitamin C tablets such as Tab CaC 1000 plus can be added to the basket to ensure rich supply of vitamin C.

- **Iron and Zinc:** Low in cereals however addition of legumes can increase the content of non-haem iron. Fortified cereals with zinc and iron are helpful. However, it is not possible to meet the RNI for Iron and Zinc through a food-based approach unless some meat, fish and poultry is included (50g). Furthermore, if dried apricot/figs/dates and meat is available that can be added. We can also add tablets and syrup as below for vulnerable population.
  - Adults: Tab Surbex-Z
  - Children: Syrup Zincate

- **Vitamin B1 Thiamine:** Whole grains, meat and fish. Dairy products and most fruits contain little thiamine. Nuts, grains and pulses can be added to the food basket.

- **Sodium & Potassium:** Table salt, pickles, baking powder, roasted peanuts and nuts are rich sources of sodium. Potatoes, beans and dried apricots, peaches, raisins are rich sources of potassium. These can be easily added to the basket due to long shelf life.

Food Basket & Corona

- Food Basket should contain vitamin-rich foods and supplements at the 1,000 IU level.

- Zinc rich food like meat, poultry both fresh and dried can be added along with beans, nuts and fortified cereals.

- Vitamin C rich foods are also recommended, including seasonal fruits and vegetables that are locally available seasonally such as guava, mangoes, melon and citrus fruits.

- Ginger can be added as it is a strong antioxidant and natural boost.

Sample Baskets

Following figures shows the example of different standard food baskets. Furthermore, the requirements of the pregnant and lactating ladies, children and the elderly are also explained in the figures below.

Standard Basket 1	
Food Item	**Weight/Quantity**
Wheat flour (fortified)	25 Kg
Rice (cost effective)	20 Kg
Chickpeas/Pulses/Beans/Legumes	5 Kg
Potatoes/Sweet potatoes/Carrots/Turnips/root vegetables	5 Kg
Onions	5 Kg
Semolina (Suji)	2.5 Kg
Sugar	5 Kg
Vitamin A&D fortified Cooking Oil	5 Liters
Peanuts/Nuts	2 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Ginger/Garlic	0.5 Kg
Green/Red Chilies	0.5 Kg
Dried Fig/Dates	1 Kg
Milk Powder*	2 Kg

*Milk Powder should be used for tea

Standard Basket 2	
Food Item	**Weight/Quantity**
Wheat flour (fortified)	20 Kg
Maize Flour (Makai atta)/Basin	5 Kg
Rice (Cost effective variety)	10 Kg
Chickpeas/Pulses/Beans	5 Kg
Potatoes/onions/carrots/other root vegetables	5 Kg
Panjeeri	1 Kg
Semolina (Suji)	2.5 Kg
Sugar	2 Kg
Vitamin A & D fortified Cooking Oil	5 Liters
Mixed Dry fruit	1 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Milk Powder*	2 Kg
Ginger/Garlic	0.5 Kg
Porridge/Dalya	2.5 Kg
Qulchay/Amrasay/local snacks	2.5 Kg

*Milk Powder should be used for tea

Figure 4: Standard Basket 1 and 2 for a family of 5 adults for 30 days

Standard Basket with Adjustment

Standard Basket 1	
Food Item	**Weight/Quantity**
Wheat flour (fortified)	25 Kg
Rice (cost effective)	20 Kg
Chickpeas/Pulses/Beans/Legumes	5 Kg
Potatoes/Sweet potatoes/Carrots/Turnips/root vegetables	5 Kg
Onions	5 Kg
Semolina (Suji)	2.5 Kg
Sugar	5 Kg
Vitamin A&D fortified Cooking Oil	5 Liters
Peanuts/Nuts	2 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Ginger/Garlic	0.5 Kg
Green/Red Chilies	0.5 Kg
Dried Fig/Dates	1 Kg
Milk Powder*	2 Kg

*Milk Powder should be used for tea

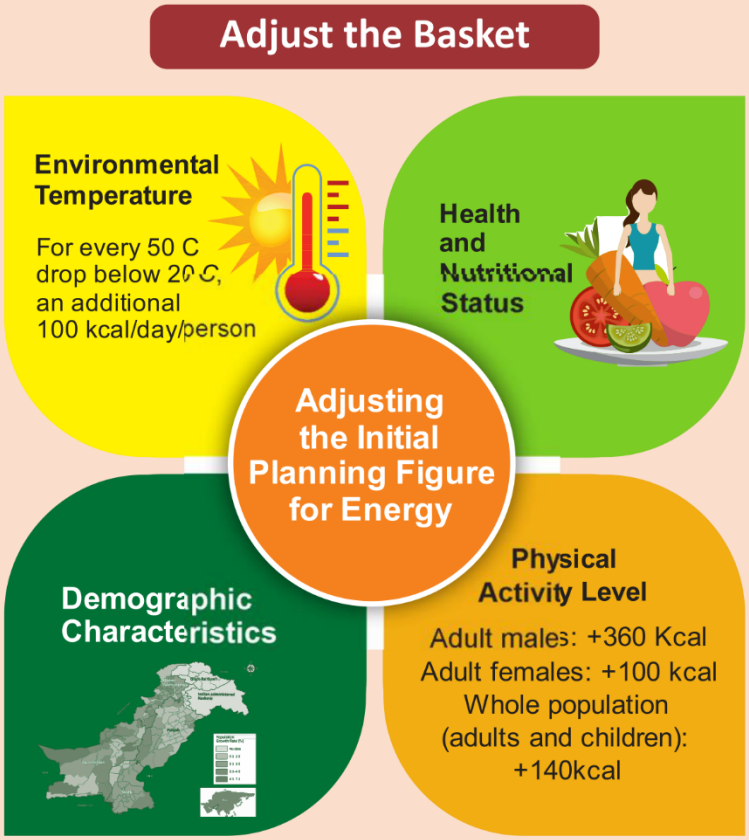
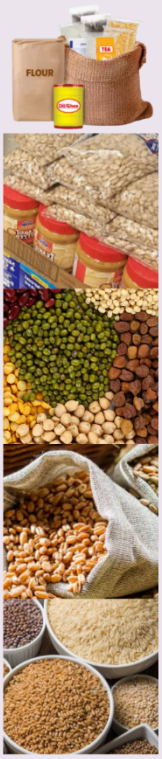


Figure 5: Adjustment of the standard baskets according to the needs of the population

Basket 3 (Pregnant & Lactating Women)



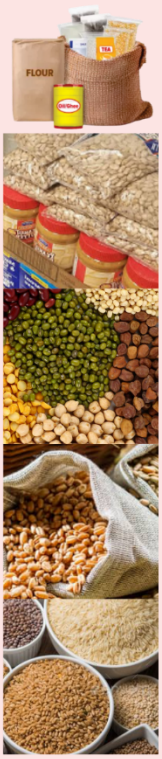
Standard Basket 1	
Food Item	**Weight/Quantity**
Wheat flour (fortified)	25 Kg
Rice (cost effective)	20 Kg
Chickpeas/Pulses/Beans/Legumes	5 Kg
Potatoes/Sweet potatoes/Carrots/Turnips/root vegetables	5 Kg
Onions	5 Kg
Semolina (Suji)	2.5 Kg
Sugar	5 Kg
Vitamin A&D fortified Cooking Oil	5 Liters
Peanuts/Nuts	2 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Ginger/Garlic	0.5 Kg
Green/Red Chilies	0.5 Kg
Dried Fig/Dates	1 Kg
Milk Powder*	2 Kg

*Milk Powder should be used for tea

Specifically for Pregnant & Lactating Women	
Food Item	**Weight/Quantity**
Additional Requirement /day	285-500 kcal/day
Mixed Cereal/pulse diet	
Locally available Fortified Blended Food	
Nuts/Peanuts/grains	1 Kg
Dry Apricot	1 Kg
Water	Extra 1 liter/day
Tab CaC plus	1 tab/day
Pregnant Women	
Iron	60 mg/day
Folic acid	400 µg/day
Lactating Women	
Vitamin A	400,000 IU in 2 doses
Nutrition Education & Counseling	

Figure 6: Food Basket 3 (standard basket with addition of items for pregnant & lactating women). The items can be added according to number of pregnant/lactating women in the family.

Basket 4 (Infant & Young Children)



Standard Basket 1	
Food Item	**Weight/Quantity**
Wheat flour (fortified)	25 Kg
Rice (cost effective)	20 Kg
Chickpeas/Pulses/Beans/Legumes	5 Kg
Potatoes/Sweet potatoes/Carrots/Turnips/root vegetables	5 Kg
Onions	5 Kg
Semolina (Suji)	2.5 Kg
Sugar	5 Kg
Vitamin A&D fortified Cooking Oil	5 Liters
Peanuts/Nuts	2 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Ginger/Garlic	0.5 Kg
Green/Red Chilies	0.5 Kg
Dried Fig/Dates	1 Kg
Milk Powder*	2 Kg

*Milk Powder should be used for tea

Specifically for Infants & Young Children
Food Item
Combinations of cereals and pulses with added oil and sugar.
Recipes can be developed using local foods with input from nutrition and/or health expertise.
Fruit, vegetables, eggs or other suitable locally available foods
All infants normally be exclusively breast-fed for the first six months
At 6 months of age, infants should start to receive complementary foods in addition to breast milk

Figure 7: Food basket 4 (standard basket with addition of items for infants & young children). The items can be added according to number of infants/children in the family.

Basket 5 (Older Persons)

Standard Basket 1	
Food Item	**Weight/Quantity**
Wheat flour (fortified)	25 Kg
Rice (cost effective)	20 Kg
Chickpeas/Pulses/Beans/Legumes	5 Kg
Potatoes/Sweet potatoes/Carrots/Turnips/root vegetables	5 Kg
Onions	5 Kg
Semolina (Suji)	2.5 Kg
Sugar	5 Kg
Vitamin A&D fortified Cooking Oil	5 Liters
Peanuts/Nuts	2 Kg
Iodized Salt	1 Kg
Tea	1 Kg
Ginger/Garlic	0.5 Kg
Green/Red Chilies	0.5 Kg
Dried Fig/Dates	1 Kg
Milk Powder*	2 Kg

*Milk Powder should be used for tea

Specifically for Older Persons
Food Item
Varieties of locally produced blended foods
Cereals, pulses, oil and sugar
Fruit, vegetables, eggs or other suitable locally available foods

Figure 8: Food Basket 5 (standard basket with addition of items for elderly persons). The items can be added according to number of elderly persons in the family.

Annexure

Table 7: Table of some locally available food items in Pakistan and their caloric value as per Pakistan dietary guidelines (5).

Food Item (serving)	Calories (Kcal)
Wheat Flour (1 chapati)	160
Rice (1 plate pulao)	250
Chickpeas/Pulses (1 plate)	140
Potato curry (1 plate)	109
Peanuts (1 serving)	160
Semolina (Suji kheer)	150
Apple/guava (any seasonal fruit)	80
Egg fried (1)	90
Milk (1 cup)	150
Carrot halwa (1 plate)	250
Raita (1 bowl)	150

References

1. Workie E, Mackolil J, Nyika J, Ramadas S. Deciphering the impact of COVID-19 pandemic on food security, agriculture, and livelihoods: A review of the evidence from developing countries. Current Research in Environmental Sustainability. 2020:100014.
2. Organization WH. Food and nutrition needs in emergencies. 2004.
3. Rahman S, Hossain I, Mullick A, Khan M. Food security and the coronavirus disease 2019 (COVID-19): a systemic review. J Med Sci Clin Res. 2020;8:180-4.
4. Reardon T, Mishra A, Nuthalapati CS, Bellemare MF, Zilberman D. Covid-19's disruption of india's transformed food supply chains. Economic and Political Weekly. 2020;55(18):18-22.
5. Pakistan Dietary guidelines for better nutrition: Food and Agriculture Organization of the United Nations and Ministry of Planning Development and Reform, Government of Pakistan.

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