FOOD PACKAGES FOR DISASTER AFFECTED POPULATION IN BANGLADESH

September 2021

Technical Recommendations

Bangladesh National Nutrition council (BNNC)

National Nutrition Services

Preface

This essential and important document on technical recommendations for food packages for disaster affected population in Bangladesh was prepared by the Technical/Expert Committee formed by the Ministry of Health and Family Welfare (MoHFW) at the request of the Ministry of Disaster Management and Relief (MoDMR) under the guidance of Director General, BNNC and Line director, National Nutrition Services (NNS). At the advent of COVID-19 and based on specific needs of various age groups, subsequently three sub-groups were also formed to work each on General, Child and COVID-19 Food packages on an urgent basis. The process for preparing the nutritious food package included review of the existing government's food package. The Technical/Expert committee and three sub-groups developed a national guiding, a document on technical recommendations that would meet the scientific rationale, aligned with international standard and recommendations to meet the most micro and macronutrients requirements, and finally, proposed various food packages specific to various age groups.

While preparing the food packages, the committee members considered the locally available foods, their cultural acceptability, suitability, shelf-life, duration of food ration and costs. Specific instructions on the proposed food items, food safety & hygiene, and important health and nutrition messages with special focus on COVID-19 have been included in the guideline as well.

Based on the findings and proposed recommendations a summary guideline on nutritious food packages for age specific groups affected by disasters including COVID-19 has been prepared and submitted to the appropriate authority. The guideline along with this document on technical recommendations will immensely help policy makers, planners and implementers alike for harmonizing and better coordination among various food distribution programs implemented by the government and partners during disaster among affected people in Bangladesh.

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Background

With request from the Ministry of Disaster Management and Relief (MoDMR), the Ministry of Health and Family Welfare formed a 11 members Technical/Expert Committee on 12 March 2020 (Annex 1) to prepare a food package for disaster affected population based on scientific requirements. The committee was headed by the Director General, Bangladesh National Nutrition Council (BNNC) where the Line Director National Nutrition Services (NNS) acted as its member secretary. The committee needed to submit report along with recommendations on its assignment within 30 working days of the commencement of the assignment to the Secretary, Health Services Division (with attention to Public Health and World Health Wing, MoHFW).

Terms of Reference (TOR) for the Technical/Expert Committee were:

1. To assess food requirements for different age and target groups in disaster affected areas.
2. To review the items and contents of the current dry food basket for relief.
3. To recommend nutritionally balanced food package for different age and target groups considering cost, nutrition value, safety, availability, accessibility, transportation, distribution, storage facility and preparation of food taking into current complexities of the Covid-19 situation etc.

COVID-19 situation in Bangladesh began progressing very rapidly and has had serious implications. COVID-19 have impacts on increased infections and mortality. Lockdown measure taken to reduce spread of COVID 19 infections had devastating impact on economy, health, nutrition and food security of the population which a developing economy like in Bangladesh had far great a challenge to cope up. Nevertheless, the extent of problem was rather speculative since not much instant evidence could be gathered and hence, not fully understood.

Technical/Expert Committee had agreed to take on responsibilities to help overcome the crisis so that the current health crisis did not turn into an unescapable nutrition crisis in the future. Accordingly, the committee had agreed to propose following deliverables:

1. Recommendations of food package during the disaster including COVID-19- crisis.
2. Key nutrition messages (for both common disaster and COVID-19) that must go along the food package.
3. A broad guideline that would be followed coherently by all who implement the program at all different parts of the country.
4. Proposition of likely transition from crisis phase to rehabilitation phase including management of SAM/MAM cases.

TOR 1: To assess food requirements for different age and target groups in disaster affected areas

Bangladesh is a highly disaster-prone, and one of the most risk prone countries in the world that is going to have negative impacts of climate change, including increases in the incidence and intensity of extreme weather events (e.g. cyclone, flood) and hazards such as soil salinization, rising sea water levels and riverbank erosion. For Bangladesh there is also the risk from earthquakes, that pose a serious challenge to one of the fastest growing unplanned cities in the world. Usually it is the poorest, the most marginalized and the most vulnerable communities who are hit hardest by disasters in Bangladesh since

they are repeatedly exposed to natural hazards even often before they recover well from the previous ones. Disaster may involve destruction of assets and infrastructure and a breakdown of essential services, including health, nutrition services, and water supply, sanitation systems. During a disaster, household access to food is often a challenge and for many households it is compromised to minimum or none. Many people may be displaced, migrated and forced to live in overcrowded settlements like cyclone centre and embankment.

As a consequence of the shifts to unsettled settlement, malnutrition, including micronutrient deficiencies can easily be developed or worsen during disaster situations. Most frequently those are further exacerbated. Women and children are most vulnerable and the worst sufferer of a disaster. Therefore, early actions are needed to meet their nutritional needs to avoid a deterioration of their nutrition situation. Experience has shown that infant and child morbidity and mortality rates often dramatically increase during and immediately after a disaster. Therefore, the committee carefully made following scientific and practical considerations before preparing the report.

General Food Ration Basket

1. Energy and nutrient calculation considered the following elements:

- Current food package of the Ministry of Disaster Management and Relief (MoDMR) (both contents and quantity).
- Compliance to International and National guidelines.
- The average (weighted) 2,100 Kcal/person/day as energy requirement of emergency affected population (as per international guidelines).
- The mean per capita energy requirement for a population has been calculated by taking the weighted-average requirements for each age-sex group.
- The mean per capita energy requirement is not specific to any age or sex group and should therefore not be considered as the requirement of a particular individual.
- The estimate of 2,100 kcal/person/day which is estimated average requirement for normal people was used to design even for the needs of pregnant and lactating women who are physiologically more demanding for their own and for their babies' cause.
- In line with FAO/WHO technical reports, supplies must contain minimum of 10% and a maximum of 15% of dietary energy from protein source.
- Supplies must contain, at least 30% of dietary energy as fat for children 6-23 months, 20% for pregnant and lactating mother and 17% for other age groups.
- One RNI (Reference Nutrient Intake) (weighted average) of micronutrients.
- Cover all age and target groups (e.g. children, women and elderly, etc.) in the family.
- Committee members also considered the following issues and concerns regarding food selection:
- Shelf-life of each food item.
- Culturally acceptable, readily available food items.
- Use of fortified foods (rice, oil, salt and biscuits) to prevent micronutrient problems of public health importance.
- Cost of items/ food package.

2. An Average estimate of five members per household.

3. Minimum ration for seven days in one basket (for dry ration).

4. Initial first three (3) days of intervention as immediate response through a survival package, followed by general dry food ration package/basket for other days.

TOR 2: To review the items and contents of the current dry food basket for relief.

Review and assessment of current food package

General comments

The current food package may provide overall 1710 Kcal/person/day for a five member family for only 5.5 days (Table 1) instead of 7 days. Details are provided in the figure 1 and 2. Currently packaged Miniket rice which lack vitamins and minerals are not right kind of rice to be proposed as food ration. Furthermore, percentage of starch and protein contents of Miniket variety of rice is increased due to removal of outer part of big grain which is skin with fiber. The food items have not considered the specific needs of children, under-five children in particular (both items and nutrients contents). Noodles are unhealthy and unable to fulfill the demanded requirements of nutrients.

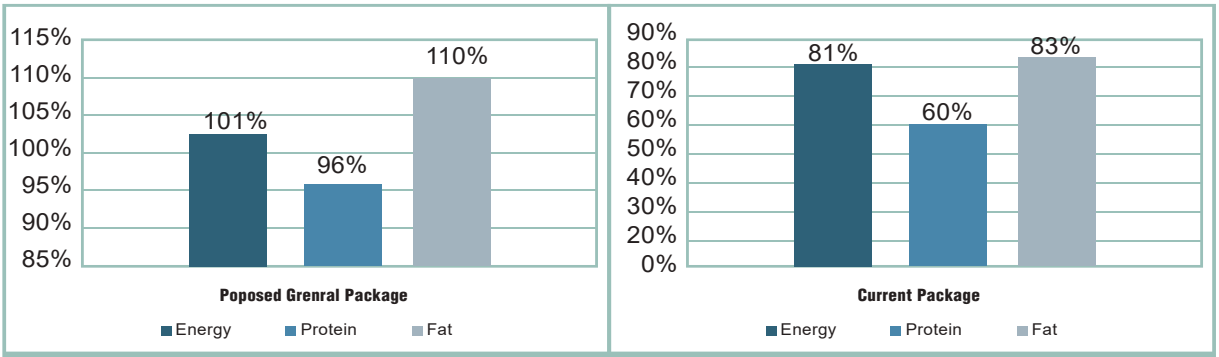


Figure 1: Comparison between proposed ration and current rations

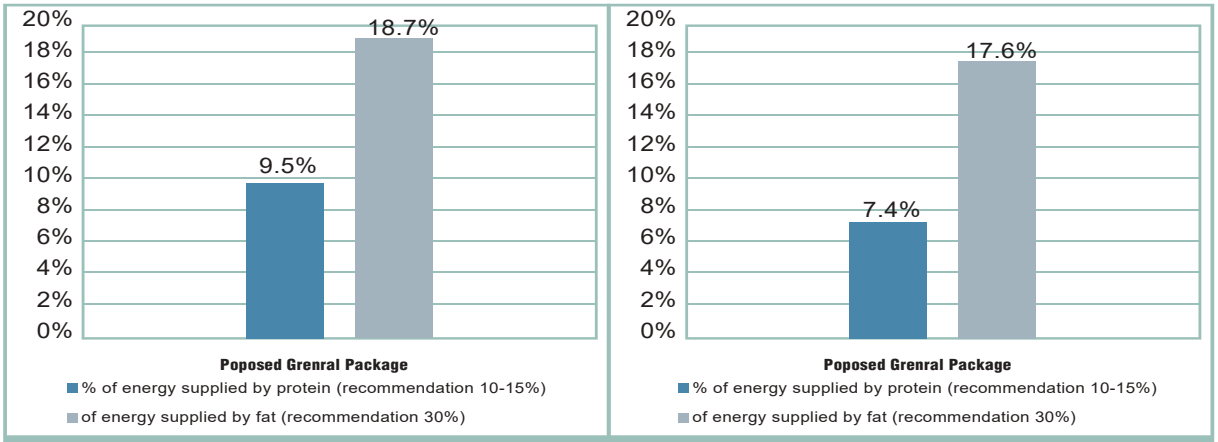


Figure 2: Comparison between proposed ration and current rations

Table 1: Macro nutrient content/distribution of current food package (CFP)

Commodity	Per person/day	
	(gm/p/ day)	Energy (Kcal)
Miniket rice	286	984
Fortified vegetable oil	29	256
Lentil	29	92
Rice flakes (chira)	57	203
Salt, Iodised	29	0
Sugar	29	115
Noodles	14	60
Total	473	1,710

Specific comments on nutrient contents

The food items don't satisfy the recommended amount as suggested in the international guidelines for food ration (ration for relief during disaster should supply 60-65% dietary energy as carbohydrate, minimum of 10% and a maximum of 15% of dietary energy as protein and at least 17% as fat). For example, the package provides total 1711 kcal and meets about 81% of energy, 60% of protein and 83% of fat requirements (Figure 3), of which 17.6% from oil and 7.4% are from protein (figure 4).

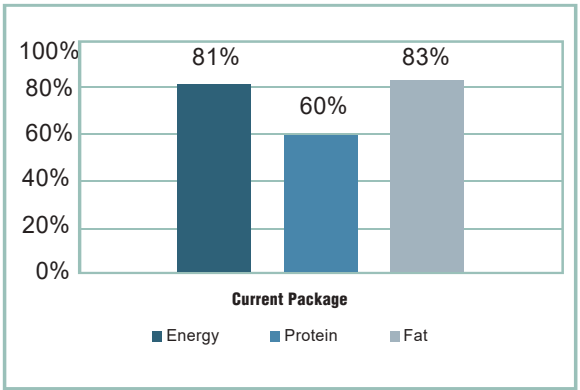


Figure.3: Percent of requirement(Carbohydrate, Protein and fat) supplied by current ration

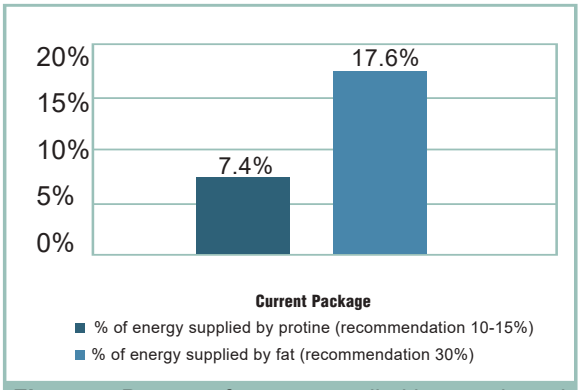
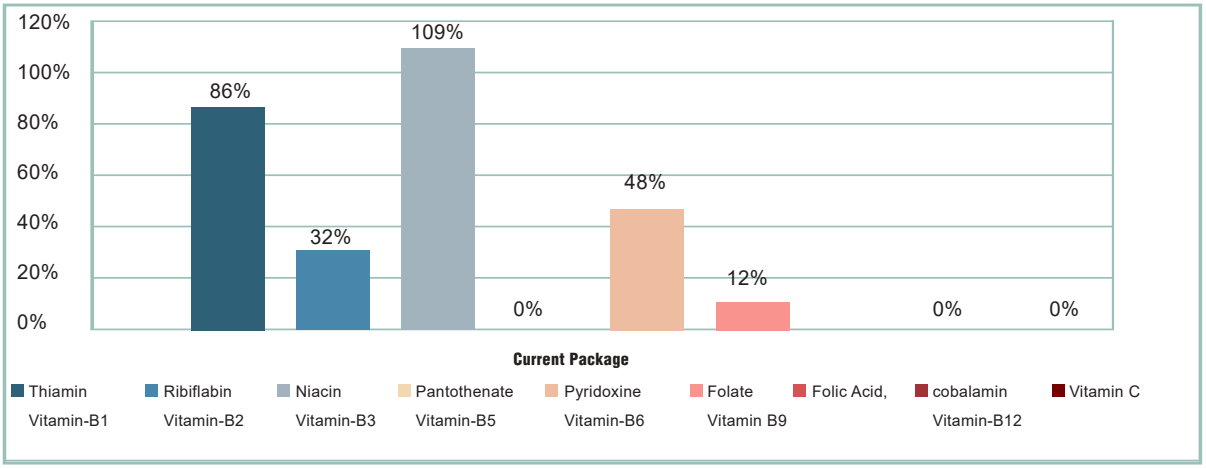


Figure 4: Percent of energy supplied by protein and fat of current ration

All water soluble vitamins available in the current food ration except Niacin-B3 (109%) are below their daily requirements, for example, thiamin-B1 (86%), ribiflabin-B2 (32%), Pantothenate-B5 (0), Pyridoxine-B6 (48%), folate (12%), Folic Acid, (0), cobalamin-B12 (0) and Vitamin C (0) (Fig. 5).

Figure 5: Vitamins (water soluble) contents of the current food package



In the current food ration, among the fat-soluble vitamins, 58% of Vitamin A, 36% of Vitamin D and 5% of Vitamin E, 0% of Vitamin K are met, which are far below their recommended requirements (Fig 6).

In the current ration, for mineral contents, except for copper (95%) and magnesium (85%) all minerals content with public health problems are far below their recommended requirements. For example, Iron (25%), Zinc (46%), Selenium (0%) (Fig. 7). On the other hand, Sodium/Iodine content is 847% which is much higher than the required amount.

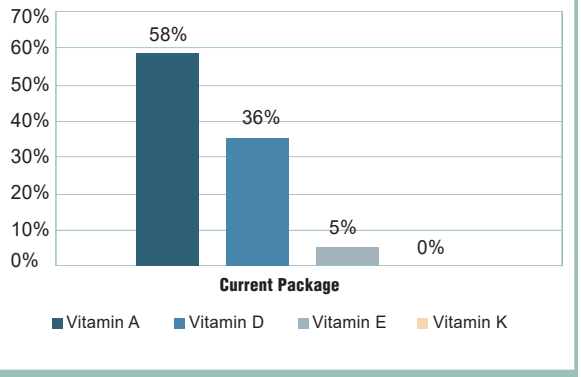


Figure.6: Vitamins (fat soluble) contents of the current food package

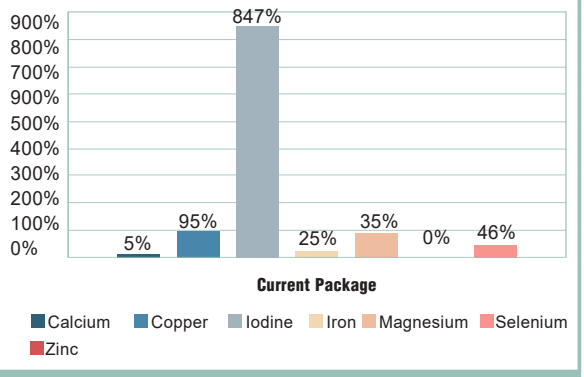


Figure.7: Mineral contents of the current food package

TOR 3: To recommend nutrition rich/balanced food package for different age and target groups in consideration of the cost, nutrition value, safety, availability, accessibility, transport, distribution, storage, and preparation of food etc

I. Proposed food relief for post disaster response

1. Immediate food response (first 3 days after the disaster)

The food response during this period will be considered as a survival package applicable when people are in desperate need of food, e.g. when people are at the shelters (in cyclone centers, river embankment etc.) or at home where there is no cooking facilities. The ration should be for first two to three (2-3) days for a 5 member family per household. This will provide about 1,525 Kcal/person/day, which will meet 73%, 55% and 36% of the daily energy, protein and fat requirements respectively (Table 2 and Figure 8). The package will provide 7.6% protein against recommended 10-12% and 8.6% fat against recommended 17% (Figure 9).

Table 2: Proposed general ration (immediate ration at the shelter for 3 days)

Commodity/ Food item	Per person per day		Ration for 5 persons for 3 days	Cost (BDT) At current Market price
	gm/person/day	Energy (Kcal)	Kg/HH/3 days	
Flattened rice (Chira)	300	1068	4.5	
Sugar/Molasses	30	119	0.45	
Fortified Biscuits	75	338	1.13	
Total	405	1,525	6.75	

Note: Micronutrient profiles of rice flattened /chira and molasses are good compared to suji/semolina and white sugar. If there are difficulties to procure chira or molasses, the gap can be met by additional fortified biscuits. Water purifying tablets with instruction for use should be ensured by the health department.

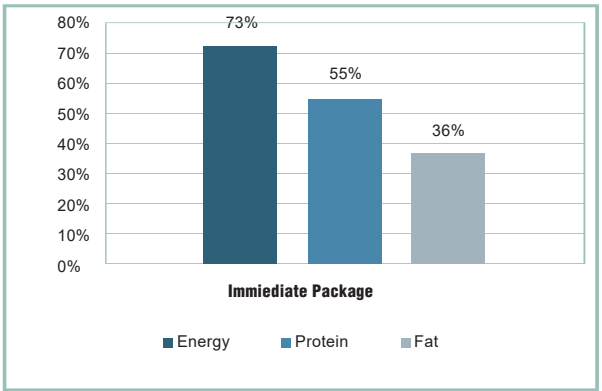


Figure 8: % of requirements (carbohydrare, Protein and fat) supplied by immediat proposed package

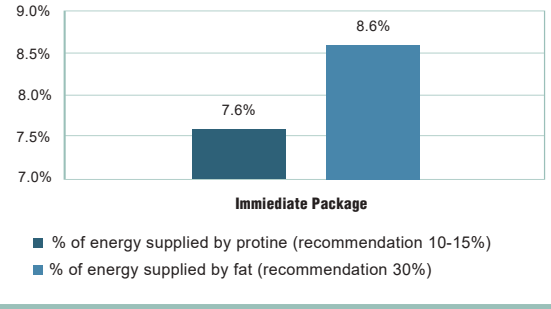


Figure 9: % of enetgy supplied by protine and fat by immediate Proposed package

It is also evident that the package will meet almost 100% of minerals requirements such as, Iron, Copper and Magnesium, however, it will partly meet the required amount of a few important minerals like, Calcium, Iodine, Zinc and hardly any Selenium at all (Figure 10).

Among the fat-soluble vitamins, 75% of Vit. A, 23% of Vit. D and 47% of Vit. E, 0% of Vit. K are met, which are far below their requirements (Figure 11).

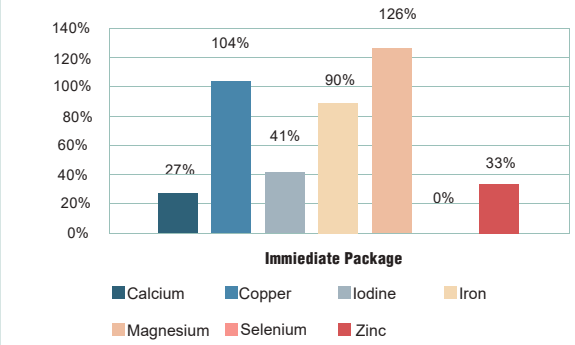


Figure 10: % of requirements (minerals and Vitamin) Supplied by immediate Proposed package

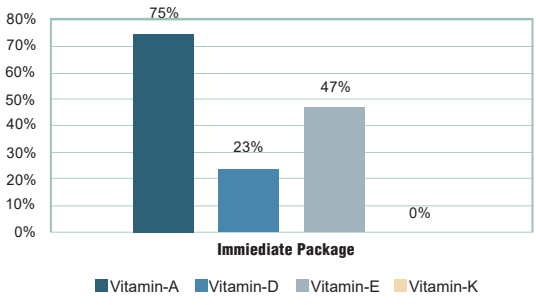


Figure 11: % of requirements (fat solible Vitamin) Supplied by immediate Proposed package

A part of their daily requirements for all water soluble vitamins, for example, thiamin-B1 (92%), ribiflabin-B2 (66%), Niacin-B3 (37%), pantothenate-B5 (49), pyridoxine-B6 (67%), folate (35%), folic acid, (-), cobalamin (68%) and vitamin C (63) will be met (Figure 12).

Fig 12: % of requirements (water soluble vitamins) supplied by immediate ration

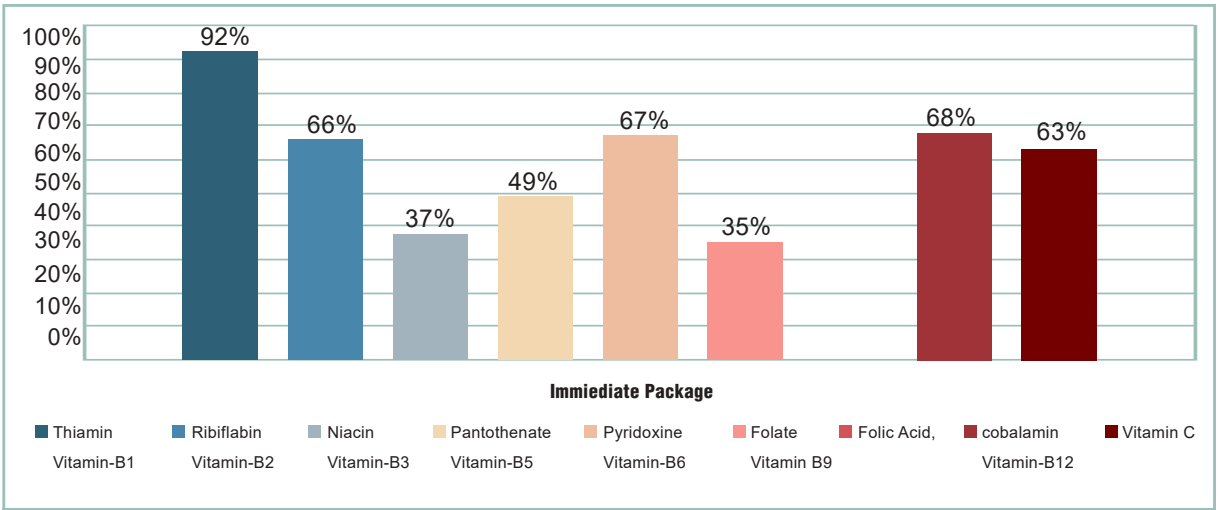


Figure 12: % of requirements (water soluble vitamins) supplied by immediate ration

2. General ration at household where cooking is possible

The recommended items and quantities of the general ration package of dried food items are arranged in line with the international and national guidelines to cover all age groups (children, women and elderly) people in a family of total five members for 7 days (Table 3). The total requirements have been estimated to cover for both 7 day and 10 day packages. Fortified food items for rice, vegetable oils, and iodized salt have been recommended. However, the committee recognizes that good coordination with Ministry of Food would be required to ensure and maintain an uninterrupted supply chain of fortified rice, given the high demand it would create vis a vis the current in-country product capacity of fortified rice in particular.

Table 3: Food items/commodity, requirements, quantity of each item

Commodity	Per Person/Per day		7 days for a HH (5 members)		10 days for a HH (5 members)
	gm/p/ day	Energy (Kcal)	Kg/HH/7 days	Kg/HH/7 days	Kg/HH/7 days
Rice*	345	1242	12.08	17.25	17.25
Fortified vegetable oil	40	354	1.40	2.00	2.00
Pulse**	40	127	1.40	2.00	2.00
Chira	50	178	1.75	2.50	2.50
Iodised salt	5	0	0.18	0.25	0.25
Sugar/ Molasses**	6	24	0.21	0.30	0.30
Motor dal or Mung dal vaja	60	196	2.1	3.00	3.00
Total	546	2,121	19.11	27.30	27.30

*Fortified rice is preferable to fill up the micronutrient requirement of the affected population.

** Except khesari dal; Lentil was considered during nutrient calculation.

** The nutrient profile of molasses are better as compared to sugar.

The package will provide 2,121 Kcal/person/day, of which about 9.5% will come from protein and 18.7% from fat (Table 3 and Figure. 13). This represents 101% of required energy, 96% of required protein and 110% of the of required fat (Figure. 14).

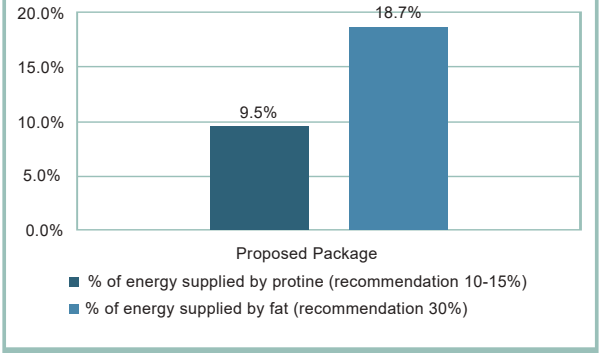


Figure.13: % of requirement supplied by proposed package

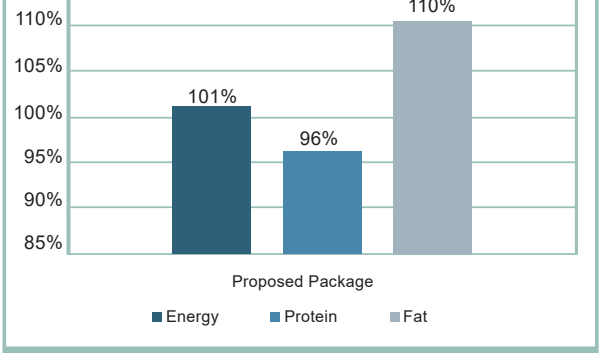


Figure.14: % of requirement(CHO, Protein and fat) supplied by proposed package

It is evident from the Figure 15 that in the proposed ration though some of the water soluble vitamins (e.g. Thiamin, Folate, Pantothenate, Cobalomin, etc.) exceed 100% of the requirements, but they are within their upper tolerable limit. In addition, as these mentioned vitamins are water soluble vitamins, their excess would be lost during washing, cooking process of the foods. After absorption excess water soluble vitamins will be excreted from the body through urine. On the other hand, of the fat soluble vitamins (A, D, E, K) except Vitamin A, all others are below the required amount (Figure 16). The proposed ration provides the required amount of all minerals except calcium and selenium (Figure17).

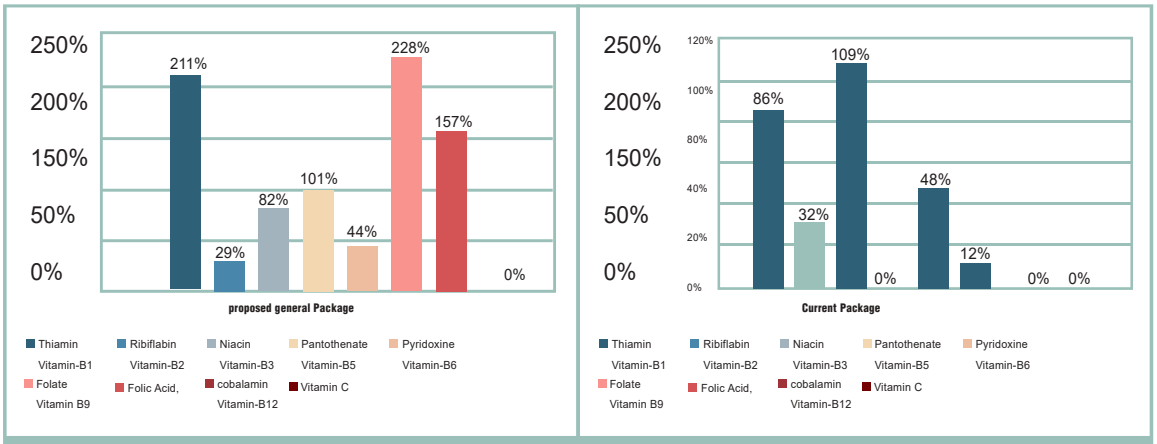


Figure. 15: % of requirement of water soluble vitamins from proposed package against the current package

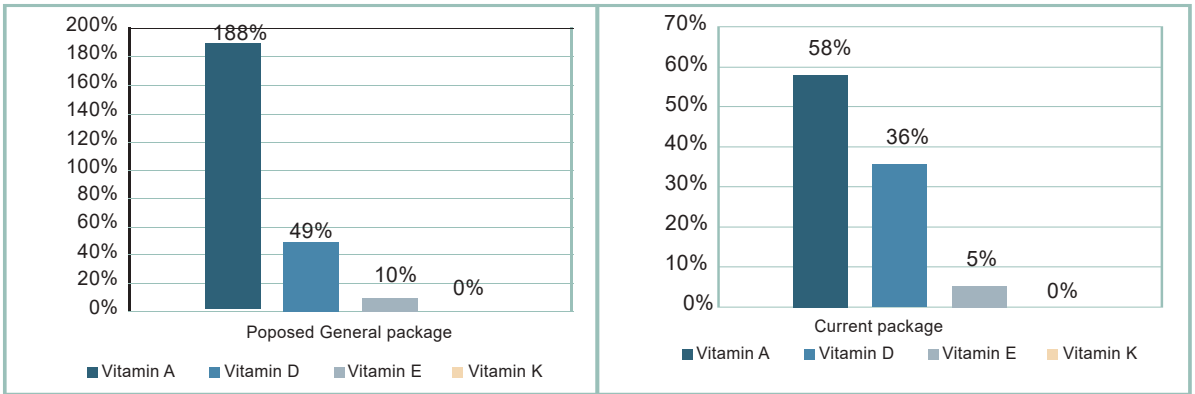


Figure. 16: % of requirement of fat soluble vitamins

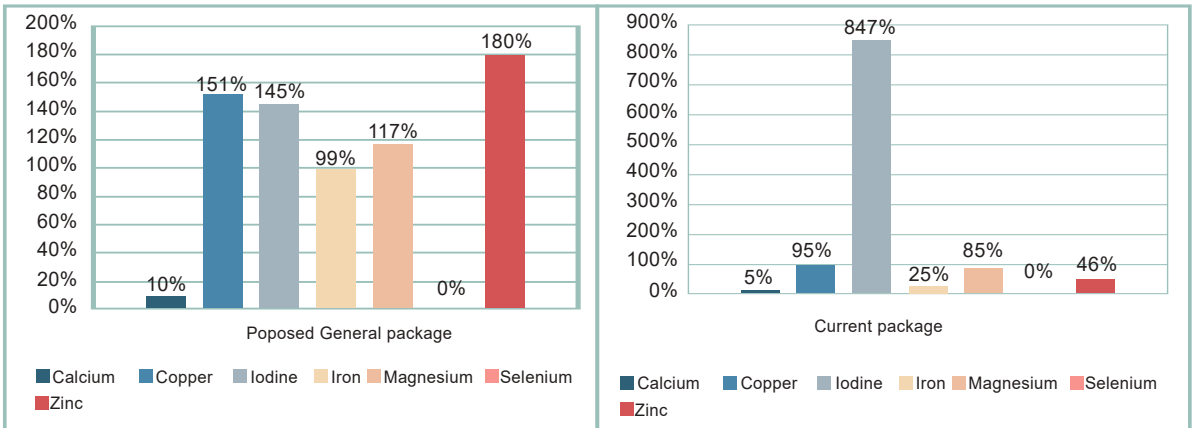


Figure. 17: % of requirement of minerals from proposed package against the current package

Following messages/instructions should be added on the supply bag of the food package:

- This package includes molasses/brown sugar instead of white sugar since it is healthier, and it provides more minerals. Therefore, wherever possible/available please add molasses/brown sugar instead of white sugar.
- Include seasonal fruits, vegetables and roots which contain Vitamin-C, i.e., Guava and Amloki, etc.
- Ensure to have safe water for drinking and soaking of chira (use water purifying tablet if needed). Please add proper instruction.
- Include also some calcium rich fruits and vegetables.

Instructions for General Food Package

- Includes fortified rice instead of normal rice. Without fortified rice it is difficult to fill up micronutrients (Vitamin A, Vitamin B, B12, folic acid, iron and Zinc) gaps of the affected population.
- Includes molasses/brown sugar instead of white sugar as it is healthier and provides some additional minerals
- Include seasonal fruits and roots which contain Vitamin-C, i.e., Guava and Amloki (see the list fruits and vegetables in Annex 3).
- Ensure use of safe water (Add purified tablet if needed)

II. Food package for children (under-five) during disaster

During a disaster, children under 5 years are particularly nutritionally vulnerable, as they require frequent feedings with diverse and nutrient-dense diets. In emergency, lactating women need supports to prevent discontinuation of breastfeeding. Breast milk is the ideal food for healthy growth and development of infants and young children. During a disaster, breastfeeding provides a fundamental source of nutrition to prevent malnutrition and thereby increasing infants and young child mortality. Therefore, all efforts must be taken to ensure to protect and promote breastfeeding until the age of 2 years in any disaster situation.

The older infants and young children require complementary feeding and food for them must be those that are easily digestible. These food should be safely prepared and chosen from locally available foods that are rich in energy and possess micronutrients to meet the changing nutritional requirements of the infants. This can be a significant challenge during disaster as not a single disaster is without any constraint like lack of logistics, and resources. In reality in any disaster, preparing food into a soft, semi-solid form is also a serious challenge. However, in disaster situations, there are a number of foods that can be used for the preparation of suitable complementary foods.

Review of current package

- The technical team found the prepared list of food items of MoDMR for current COVID-19 crisis as quite thorough and those are highly appreciable. Nevertheless, purchase and use of any kind of powder milk to use those as a baby food during disaster is against the recommended international and national guidelines. Furthermore, this contradicts the existing BMS Act 2013 [i.e. Breast-milk Substitutes, Infant-Foods, Commercially Manufactured Complementary Foods and Accessories Thereof (Regulation of Marketing)], which was gazetted on the 22th September,2013.
- The committee also observed that "quality ready-made food" are included in the baby food list. Without proper guideline, it would be difficult to monitor whether unhealthy processed food available in the market are included in the list. It is therefore, recommended to take out this food item/s from the list.
- Age group of the children in the instruction is not mentioned. Specific age group for instance, 6-59 months should be mentioned otherwise it may create confusion in selection of food items.

1. Food Package for Children during disaster (general)

Following issues were considered in energy and nutrient calculation:

- The child food package (including most of its item/commodities) which was circulated by the Ministry of Disaster Management and Relief (MoDMR) has been used except "Milk Vita Milk powder" sugar and "quality ready-made food".
- Compliance to the international and national guidelines.
- 1,076 kcal was taken as an estimated average (weighted) of energy requirement for children 6-59 months. Of the total energy, supplies of minimum of 10% and a maximum of 15% of dietary energy as protein and supplies of at least 30% of dietary energy as fat.
- One RNI (weighted average) of micronutrients for the requirement of children.
- Along with food items, a few tables of recipes have also been prepared and included in the final recommendations.
- In the preparation of a seven and ten day child food package, committee agreed to consider two (2) children aged 6-59 months per family as a basis for calculation of total ration.

Committee also took note of the following concern about food items:

- Shelf life of each food item.
- Cultural acceptability, whether readily available of food.
- Use of fortified foods (rice, oil, salt and biscuits) as much as possible.

• Cost of items/ food package.

2. Proposed food package for children during COVID-19 crisis

During the COVID-19 crisis same general package for children as proposed for other group is recommended. In addition, a certain amount cash is also recommended so that fresh fruits and vegetables can be purchased that the children can consume. This is because the proposed basic household food ration does not meet the high nutritional needs of children and is unable to ensure the minimum dietary diversity. Therefore, the committee recommended, in addition to providing the ration, an additional top up cash be provided to children to ensure minimum dietary diversity.

3. Food package for children during disaster (general)

The recommended package will provide a total of 1,094 Kcal/person/day of which 10.2% and 30.1% will come from protein and fat respectively and remaining 59.7% will be from carbohydrate (Table 4 and Fig. 18). Furthermore, proposed food items will meet 102 of the energy, 103% of protein and 102% of fat requirements (Fig. 19).

Table 4: Required food items, energy value and their quantities for 7 and 10 days food package

Commodity	1 day/person		7 days for a HH (2 under five)	10 days for a HH (2 under five)
	gm/p/ day	Energy (Kcal)	Kg/HH/7 days	Kg/HH/10 days
Rice*	90	324	1.26	1.80
Fortified vegetable oil	15	133	0.21	0.30
Pulse**	20	63	0.28	0.40
Suji/Semolina	20	69	0.28	0.40
Fortified biscuit	75	338	1.05	1.50
Sugar/ Molasses**	5	20	0.07	0.10
Ground nut/peanut rosted	20	117	0.28	0.40
Dates	20	30	0.28	0.40
Total	**265**	**1,094**	**3.71**	**5.30**

*Fortified rice is preferable to fill up the micronutrient gaps of the affected population.

** Except khesari dal; Lentil was considered during nutrient calculation.

** The nutrient profile of molasses are better as compared to sugar.

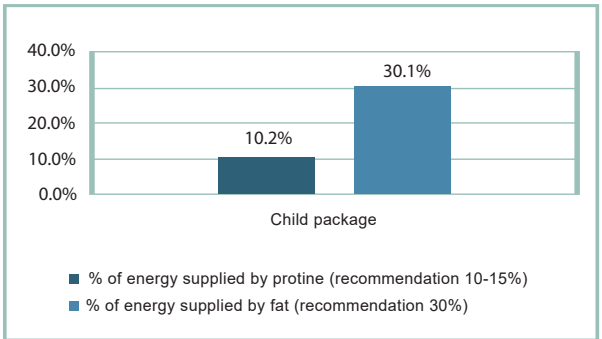


Figure.18: % of requirement supplied by proposed package.

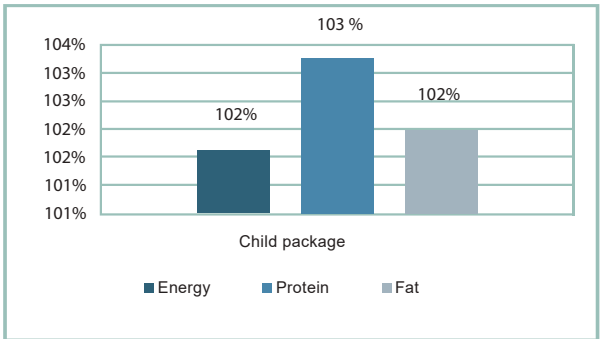


Figure. 19: % of requirement (CHO, protein and fat) supplied by proposed package

For water soluble vitamins (A and E) 100% of their requirements are provided in ration. Supply of Vitamin C is at 60% of its demand, on the other hand 40-50 percent of vitamin C will become inactive by cooking. Though some of supplied vitamins in the ration exceed 100% of their requirements, they however are within their upper tolerable limits. For example, Thiamin-B1 (223%), Riboflabin-B2 (122%), Niacin B3 (181%), Pantothenate-B5 (145%), Pyridoxin-B6 (192%), Folate-B9 (226%), Cobalamin-B12 (240%) (Fig. 20).

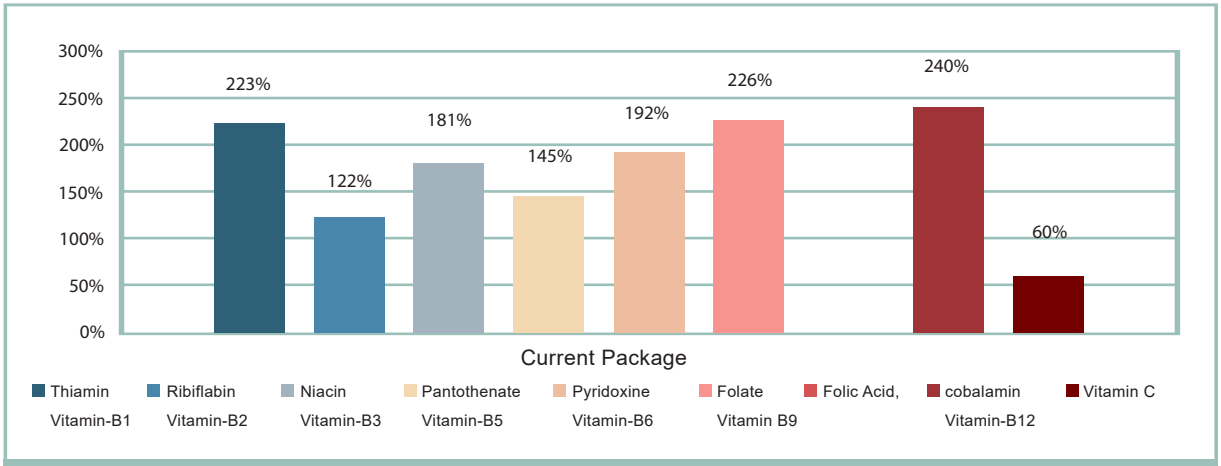


Figure. 20: % of requirements (water soluble vitamins) supplied by proposed package

For fat soluble vitamins, vitamin A (120%), vitamin E (125%) are above 100% of their requirements but within upper tolerable limits. Most of Vit A comes from plant foods in the form of beta-carotene which has no toxic effect rather it provides role as anti-oxidant. On the other hand, vitamin D (52%) and vitamin K (0%) supplies are low (Fig. 21).

It is revealed that, though two minerals (magnesium and iron) will exceed the 100% requirements (one RNI), however, they are within their upper tolerable limits. On the other hand, a few minerals (e.g. calcium, iodine, selenium and zinc) are below their requirements (Figure. 22).

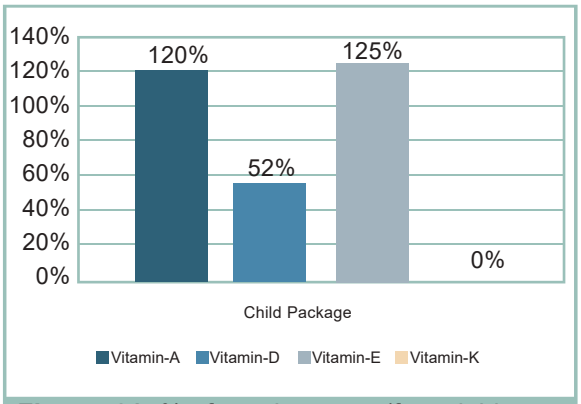


Figure. 21: % of requirements (fat soluble vitamins) supplied by proposed package

With food basket following instructions/ messages should be included:

Instructions/Messages:

- Includes molasses/brown sugar instead of white sugar as it is healthier and provides some minerals.
- Include seasonal fruits and roots which contain Vitamin-C, i.e, Guava and Amloki and Vitamin A in orange sweet potato. Vitamin C and Zinc has capacity to boost the immune system. List of Vitamin C and Zinc rich sources of commonly consumed foods of Bangladesh is provided in Annex 3 & 4.
- Add Fortified salt into Khichuri.
- If available, add an animal protein source (i.e., egg) and fresh seasonal vegetables e.g. tomato.
- Add a bit of ginger and garlic into Khichuri recipe.
- While adding roasted peanut, make sure to lightly powder or grind it.
- Ensure use of safe water (add purified tablet if needed).
- Use just enough water while cooking rice - in case of excess water, use it in dal or other preparations.
- Nutrition messages with focus on hygiene and nutrition.
- Add water purifying tablets.
- Instruction/guidelines- leaflet.

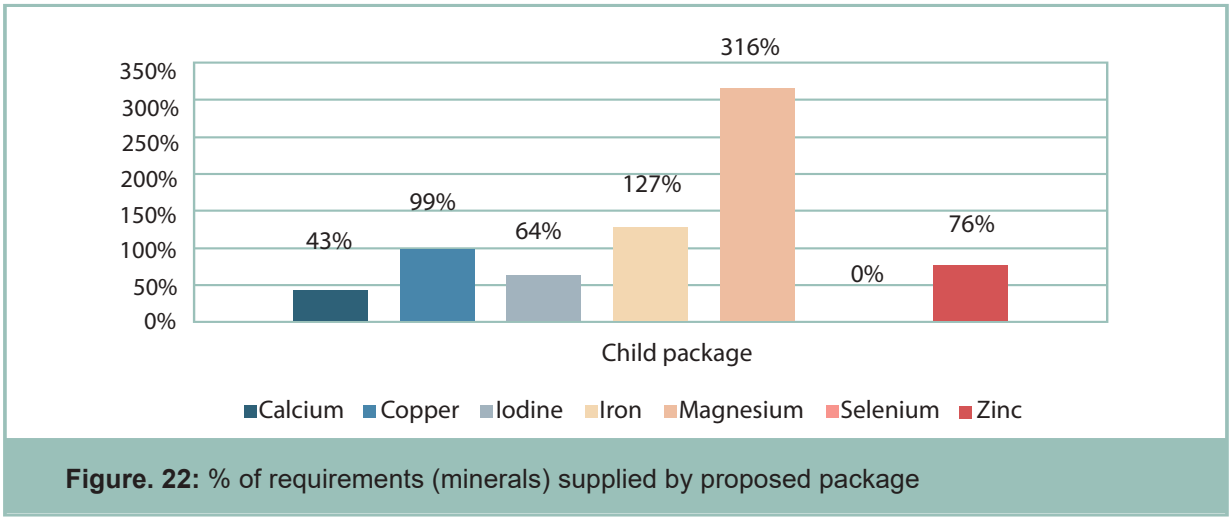


Figure. 22: % of requirements (minerals) supplied by proposed package

Recommended convenient food for children with recipes

Vegetable Khichuri

- Is a nutritious as well as easy-to-prepare recipe which is affordable when local foods/ingredients such as rice, lentil, vegetables, turmeric, cumin, salt and oil are used.
- It can fill almost close to a 1/3 of total day's energy and protein requirement for a young child.
- The combination of cereals and lentils in a proportion of 2:1 enhances the protein quality due to mutual supplementation of cereal and pulse proteins.
- The energy density of the recipe is increased with the addition of oil which also helps improve absorption of pro vitamin A from vegetables like carrot, pumpkin that are used in the recipe.
- If feasible, adding an egg to the khichuri will provide animal source protein and will enhance nutrient bioavailability.

Ingredients (g): Rice 40, lentil 20, roasted powdered groundnut 5, carrot 15, cow pea 15, spinach 15, oil 10, onion 20, spices (ginger, garlic and turmeric powder) 5, water 370 ml.

Nutritive value: Energy (kcal) 351, protein (g) 10.58, CHO (g) 44.84, Fat (g) 4.59

Method: Heat a pot, add oil, sauté chopped onion and ginger-garlic paste for a few minutes, and then add cleaned and washed rice and pulse and groundnut powder. Saute for 1 – 2 mins. Add water and cover the pot. When rice and lentils are half done, add the cleaned, washed and chopped vegetables. Cook until all ingredients are soft and ready to eat.

Egg semolina

- Egg semolina is a main meal dish for children, using a combination of egg, semolina (suji), ash gourd, carrot, molasses and oil. Suji is considered as the first additional food for children in Bangladesh. It provides energy and protein.
- Egg is good source of energy, good quality protein, iron, essential fatty acids, and it provides vitamins A, D, E and B complex.
- Ash gourd is also a fair source of minerals and vitamins.
- Oil used helps to meet high energy requirement and to absorb fat soluble vitamins.

Ingredients (g): Semolina 30, Egg 50, Ash gourd 15, Carrot 10, Molasses 15, Oil 5, Water 165 ml

Nutritive value: Energy (kcal) 281, protein (g) 10.75 CHO (g) 36.26, Fat (g) 9.97

Method: Heat a pan and roast suji for few minutes, add in water and stir. Add washed and chopped vegetables in the suji. Cook slowly, stirring all the time until it comes to boiling point and thickens. Add egg and mix well. Add molasses, oil and cook till done.

Suji Halwa

- "Sujir halwa" is a commonly prepared sweet dish in Bangladesh.
- The recipe is a good combination of semolina, milk, sugar and coconut.
- Semolina is a rich source of energy as well as source of some B complex vitamins and protein. Addition of milk improves the protein quality while adding sugar increases additional energy in the diet.
- Carrot improves the diversity and provides some provitamin A in the dish.
- In this recipe, coconut has been used as an extra source of fat which along with added fat helps to meet energy requirement.

Ingredients (g): Semolina 20, Milk 200 ml, Sugar 20, Coconut 10, Carrot 15

Nutritive value: Energy (kcal) 180, protein (g) 5.93 CHO (g) 23.97, Fat/oil (g) 6.52

Method: Roast suji for a few minutes on a medium flame until golden brown. Add milk and grated carrot. Once well cooked, add sugar. Keep stirring to avoid lump formation and sticking to the bottom on the pan. Once done, add in coconut. When halwa leaves the pan, it is cooked and ready to be served.

Nutrition responses during COVID-19 Crisis period (Additional task added to the TOR by the Technical/Expert Committee)

COVID-19 worsened malnutrition as it ceased economic opportunity by limiting jobs, petty trading, transportation of goods thus limiting accessibility and affordability to purchase. Fear of high transmission of COVID-19 led to a decrease in breastfeeding and increased in the use of infant formula or other breast milk substitutes. Because of lockdown procedures there was increase of the price of nutritious foods. The health system was overloaded and its capacity to provide nutrition services was further weakened. Case load of SAM (Severe Acute Malnutrition) was increased and uptake of outpatient and inpatient services for SAM management was interrupted and utilization of preventive nutrition services turned to lower due to restricted movement.

Proper nutrition is fundamental to building block to increase and maintain immunity, protect against illness and infection, and support recovery. In order to build the resilience of breastfeeding children in the communities, actions to preserve and promote proper nutrition, breastfeeding is an essential approach for prevention against COVID-19 for present and for future. While no foods or dietary supplements can prevent COVID-19 infection, maintaining a healthy diet is an important part of supporting a strong immune system. Healthy, nutritious diets are critical for boosting immunity and preventing non-communicable diseases that are risk factors for higher COVID-19 morbidity and mortality.

Following issues were considered for developing the food packages for general population and Children:

1. Adopted the general food ration (dry food) package for adult and general food packages for children.
2. Built on the government's current relief package.

Assumptions:

- 20% of the energy requirements will come from own family pots, rest 80% will be from ration. It was assumed that during COVID-19 people would live a sedentary life due to imposed lockdown and thereby will have less physical activities.
- A family of 5 members per household.
- Food basket will be to cover for 7 days (aligning with the quarantine period).
- Modalities of ration services will be both in kinds and cash provision. An amount of BDT 1,365/per family for 7 days was recommended to buy fresh vegetables, fruits, fish/meat and spices to complement additional energy to the dry food package. This is to ensure provision of balance diet which is essential to boost immunity. In addition, it would also help to maintain the food chain, which had been broken down in many places. This would help the local economy to continue.
- The estimated costs of the fresh vegetables, fruits, fish/meat and spices had been determined at BDT 1,365 for a family of 5 members for 7 days duration.

Meeting the Energy and Micronutrient needs during the COVID-19 crisis for adults

The proposed/recommended food package for general relief during COVID-19 crisis would provide a total of 1,702 Kcal/person/day, of which 13.9% would come from protein and 20% from fat, the rest 66% would be from carbohydrate (Table 5 and Fig. 23). It was also revealed that the proposed food items meet 81%, 112% and 94% of the energy, protein and fat requirements (Fig 24).

Table 5: Food commodity, requirements, energy content for 7 and 10 days

Commodity	1 day/person		7 days for a HH (5 members)	10 days for a HH (5 members)
	gm/p/ day	Energy (Kcal)	Kg/HH/7 days	Kg/HH/7 days
Rice	285	980	9.98	14.25
Fortified vegetable oil	30	265	1.05	1.50
Lentil	30	95	1.05	1.50
Onion	30	18	1.05	1.50
SALT, IODISED	5	0	0.18	0.25
Potato	150	99	5.25	7.50
Holud	5	17	0.18	0.25
Dhonia	5	17	0.18	0.25
Jira	5	20	0.18	0.25
Telapia, kata chara	100	110	3.50	5.00
Kancha morich	15	7	0.53	0.75
Chilli, red, dry	5	16	0.18	0.25
Borboti	60	23	2.10	3.00
Mistikumra	60	11	2.10	3.00
Lal shak	75	24	2.63	3.75
Total	**860**	**1,702**	**30.1**	43.00

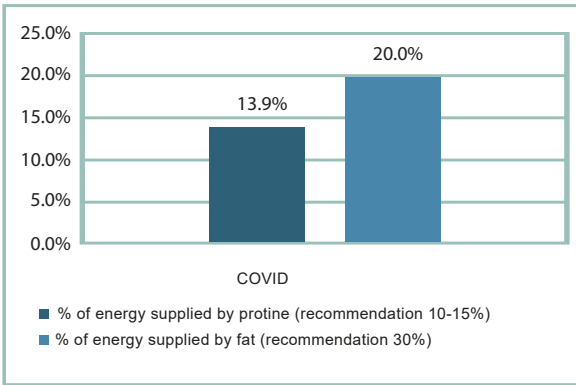


Figure 23: % of requirements of protein and fat by proposed package

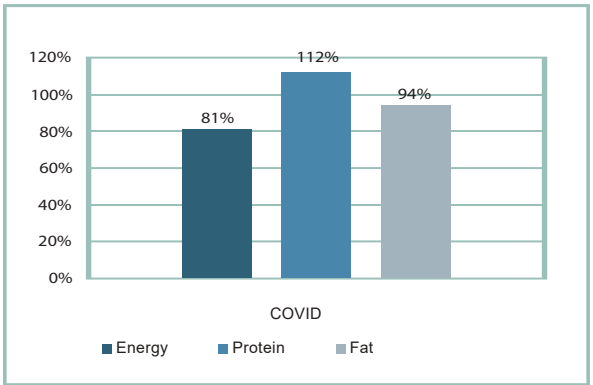
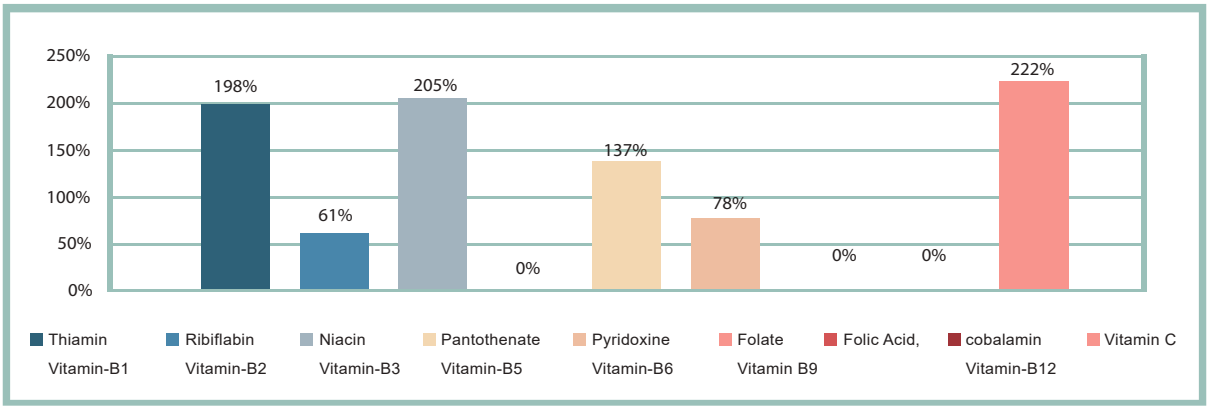


Figure 24: % of requirements (CHO, protein and fat) supplied by proposed package

Though some of the water soluble vitamins in the proposed ration (e.g. Thiamin-B1, Niacin -B3, Pyrodoxine-B6, and Vitamin C) exceeded 100% of daily requirements, however, those were still within their upper limit of the requirements. In case of vitamin C, 40-50 percent would become inactive by cooking and additional excess than required would be excreted through urine. On the other hand, Riboflabin-B2, Pantothenate, Folate-B9, Folic Acid, and Cobalamin-B12 in the proposed ration were below the recommended level (Fig. 25).

Fig. 25: % of requirement (water soluble vitamins) supplied by proposed package



Among the fat soluble vitamins, Vitamin A and Vitamin D quantity in the proposed ration exceeded 100% of their requirements (but those were within their upper limit), and vitamin E and K in the proposed ration were far below their recommended requirements (Fig 26). Most of Vit A comes from plant foods which are in the form of beta-carotene that has no toxic affect even in excess amount rather had anti-oxidant role in the body. In the proposed ration, few minerals like Copper, Iodine and Magnesium levels exceeded the 100% requirements (but were within their upper limits); and levels of Calcium, Iron and Selenium proposed were below their requirements (Fig. 27).

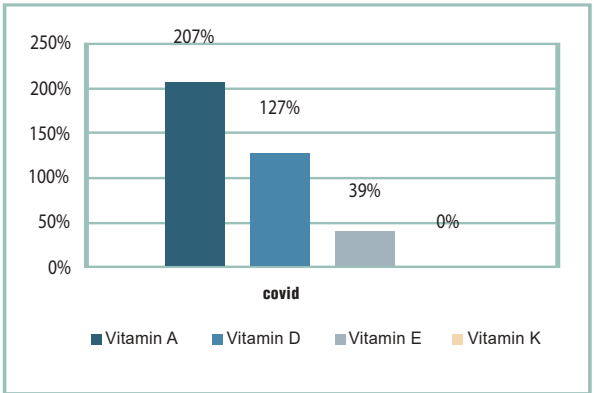


Figure 26: % of requirements (fat soluble vitamins) supplied by proposed package

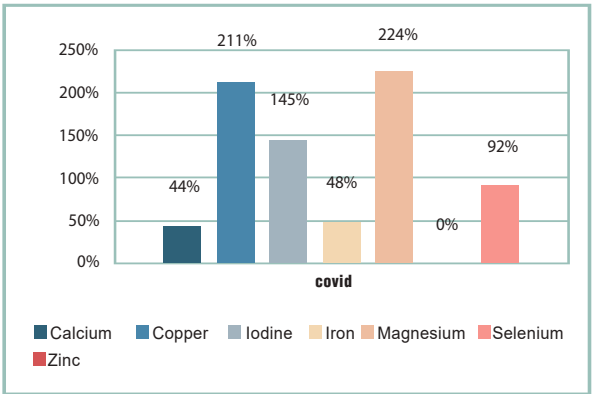


Figure 27: % of requirement (minerals) supplied by proposed package

Messages during COVID-19.

Two sets of nutrition specific messages were developed by the Technical/Expert Committee targeting both adults and children during COVID-19. Please see the Annex 5.1 and 5.2.

References

1. Management of Nutrition in Major Emergency (WHO 2000).
2. Human Energy Requirements, Report of a Joint FAO/WHO/UNO Expert Consultation, Rome, 17-24 October 2001.
4. Food and Nutrition needs in Emergency (UNHCR/UNICEF/WHO/WFP, 2002.
5. Vitamin and Mineral requirements in Human Nutrition, Second Edition, (WHO/FAO (2004).
6. Food Composition Table for Bangladesh (2014), INFS/GoB/USAID/EU/FAO.
7. Improved Recipes for Complementary Feeding of Children Aged 6-23 Months (2014) BBF/GoB/USAID/EU/FAO.
8. Dietary Guidelines for Bangladesh (2015) IRDEM/MoHFW/MoFood/USAID/EU/FAO.

Annexures

Annex: 1. Office order for the formation of the Technical/Expert Committee.

(একই স্মারক ও তারিখের স্থলাভিষিক্ত)
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
স্বাস্থ্য ও পরিবার কল্যাণ মন্ত্রণালয়
স্বাস্থ্য সেবা বিভাগ
জনস্বাস্থ্য-২ অধিশাখা
www.hsd.gov.bd

স্মারক নম্বর : ৪৫.০০.০০০০.১৭১.৭০.০০১.২০.

তারিখ : ১২ মার্চ ২০২০ খ্রিষ্টাব্দ / ২৮ ফাল্গুন ১৪২৬ বঙ্গাব্দ

অফিস আদেশ

দুর্যোগপীড়িত জনগোষ্ঠীকে প্রদেয় শুকনা খাবারের প্যাকেটসহ বিভিন্ন খাদ্য সাহায্যের পুষ্টিমান উন্নয়নের লক্ষ্যে একটি কারিগরি/ বিশেষজ্ঞ কমিটি গঠনপূর্বক সুপারিশ প্রদানের নিমিত্ত দুর্যোগ ব্যবস্থাপনা ও ত্রাণ মন্ত্রণালয় কর্তৃক স্বাস্থ্য সেবা বিভাগকে অনুরোধ করা হয়। সে মোতাবেক দুর্যোগপীড়িত এলাকায় বিভিন্ন বয়স ও টার্গেট গ্রুপের জন্য খাদ্য চাহিদা নির্ধারণ, প্রদেয় খাদ্য সাহায্যের পর্যালোচনা ও পুষ্টিমান উন্নয়ন সংক্রান্ত সুপারিশ প্রদানের নিমিত্ত স্বাস্থ্য সেবা বিভাগ নিম্নোক্ত কারিগরি/ বিশেষজ্ঞ কমিটি গঠন করলেন।

০২) কমিটির গঠন (জ্যেষ্ঠতা অনুসারে নয়) :

i.	মহাপরিচালক, বিএনএনসি	আহবায়ক
ii.	প্রতিনিধি, দুর্যোগ ব্যবস্থাপনা ও ত্রাণ মন্ত্রণালয়	সদস্য
iii.	প্রতিনিধি, বিশ্ব খাদ্য কর্মসূচি	সদস্য
iv.	নিউট্রিশন ক্লাস্টার কো-অর্ডিনেটর, ইউনিসেফ	সদস্য
v.	প্রতিনিধি, বিশ্ব স্বাস্থ্য সংস্থা	সদস্য
vi.	চেয়ারম্যান, বিবিএফ	সদস্য
vii.	অধ্যাপক নাজমা শাহীন, পুষ্টি ও খাদ্য বিজ্ঞান ইনস্টিটিউট, ঢাকা বিশ্ববিদ্যালয়	সদস্য
viii.	জনাব এ এফ এম ইকবাল কবীর, কনসালট্যান্ট, বিএনএনসি	সদস্য
ix.	ডা. কামরুন্নাহার, প্রিন্সিপাল রিসার্চ অফিসার, বারডেম	সদস্য
x.	ডা. ললিতা ভট্টাচার্য, সিনিয়র নিউট্রিশন এডভাইজার, এফএও	সদস্য
xi.	লাইন ডিরেক্টর, এনএনএস, আইপিএইচএন ভবন, মহাখালী, ঢাকা	সদস্য-সচিব

০৩) কমিটির কার্যপরিধি :

➢ কমিটি দুর্যোগপীড়িত জনগোষ্ঠীর পুষ্টি ঝুঁকি হ্রাসে-

ক) দুর্যোগপীড়িত এলাকায় বিভিন্ন বয়স ও টার্গেট গ্রুপের জন্য খাদ্য চাহিদা নির্ধারণ করবে।
খ) প্রদেয় খাদ্য সাহায্য (শুকনো খাবারের পরিমাণসহ আইটেম- সংযুক্তি-১) পর্যালোচনা করবে।
গ) খাবারের মূল্য, পুষ্টিমান, নিরাপদতা, সহজলভ্যতা, গ্রহণযোগ্যতা, পরিবহন, বিতরণ, গুদামজাতকরণ, খাদ্য প্রস্তুতকরণ ইত্যাদি বিষয় বিবেচনাপূর্বক বিভিন্ন বয়স ও টার্গেট গ্রুপের জন্য পুষ্টিসমৃদ্ধ ফুড বাস্কেট/ প্যাকেজের বিষয়ে সুপারিশ করবে।
ঘ) কমিটি আগামী ৩০ (ত্রিশ) কর্মদিবসের মধ্যে নিম্নস্বাক্ষরকারীকে দৃষ্টি আকর্ষণপূর্বক সচিব, স্বাস্থ্য সেবা বিভাগের নিকট কার্যপরিধি অনুসারে সুপারিশ প্রেরণ করবে।
ঙ) কমিটি প্রয়োজনে বিশেষজ্ঞ সদস্য কো-অপ্ট করতে পারবে।

০৪) যথাযথ কর্তৃপক্ষের অনুমোদনক্রমে এই আদেশ জারি করা হলো এবং তা অবিলম্বে কার্যকর হবে।

১২.০৩.২০২০
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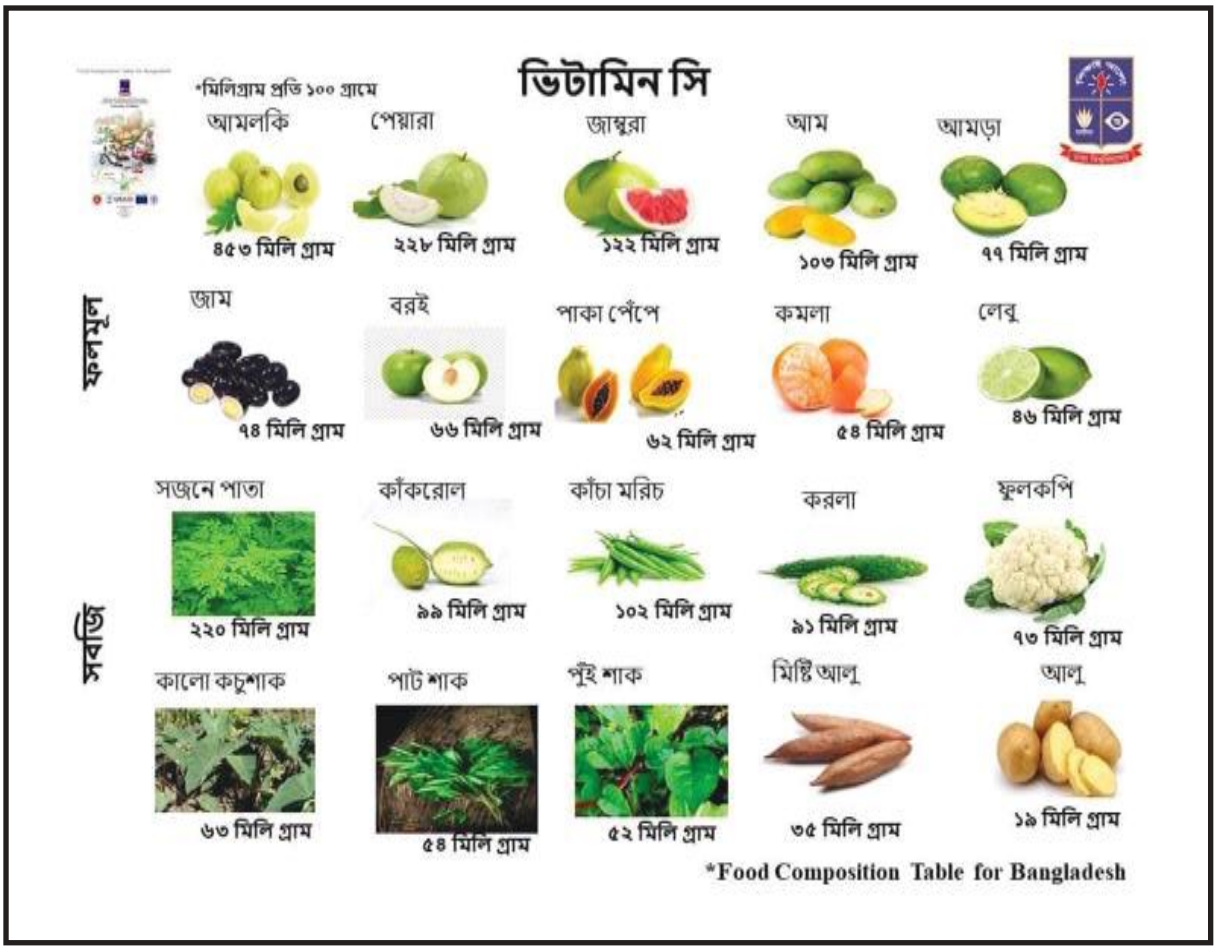
চলমান পাতা ১/২

Annex 2 : Sub-groups to prepare general food package, child food package and COVID-19 food package.

General Food Package Sub-group	Child Food Package Sub-group	COVID 19- Food Package Sub-group
Prof. Nazma Shaheen (Group Leader) Dr. Lalita Bhattacharjee A F M Iqbal Kabir Md. Sameul Nawaz Tonima Sharmin Mohammad Rony Hossain Farhana Sharmin Khurshid Jahan	Piyali Mustaphi (Group Leader) A F M Iqbal Kabir Md. Sameul Nawaz Asfia Azim Faria Shabnam Farhana Sharmin Dr. SK Roy Mohammad Hafijul Islam	A F M Iqbal Kabir (Group Leader) Prof. Nazma Shaheen Dr. Lalita Bhattacharjee Md. Sameul Nawaz Asfia Azim Faria Shabnam Farhana Sharmin Dr. Kamrunnahar

Annex 3: Food rich in Vitamin C



Annex 4. Food rich in Minerals (Zinc)

Annex 5.1: Specific nutrition messages developed by the Technical/Expert Committee for adults during COVID-19

Annex 5.2: Specific nutrition messages developed by the Technical/Expert Committee for children during COVID-19

কোভিড- ১৯ মহামারীর সময়ে শিশুর খাবার ও পুষ্টি বার্তা

কোভিড-১৯ সংক্রমণে সম্ভাব্য/আক্রান্ত মায়েদের স্তন্যদান বিষয়ক তথ্য

কোভিড-১৯ সংক্রমণে সম্ভাব্য/সনাক্তকৃত মায়েরা শিশুকে বুকের দুধ খাওয়াতে পারবেন। জন্মের ১ ঘন্টার মধ্যে মায়ের দুধ দেয়া শুরু করুন এবং জন্মের ৬ মাস পর্যন্ত শুধু মায়ের দুধ খাওয়ান। এক্ষেত্রে করণীয়:

জন্মের একঘন্টার মধ্যে শিশুকে মায়ের দুধ দিন
জন্মের পর থেকে ছয় মাস পর্যন্ত শুধুমাত্র মায়ের দুধ দিন।
শিশুর ৬ মাস বয়সের পর থেকে ঘরের তৈরি বাড়তি খাবারের পাশাপাশি পূর্ণ দুই বছর বয়স পর্যন্ত মায়ের দুধ খাওয়ান।

১. হাঁচি কাশি জনিত শিষ্টাচার মেনে চলুন এবং মাস্ক পরুন;
২. শিশুকে দুধ দানের আগে ও পরে এবং শিশুকে স্পর্শ করার আগে হাত ভালো করে সাবান ও পানি দিয়ে ২০ সেকন্ড ধুয়ে অথবা অ্যালকোহল যুক্ত হ্যান্ড স্যানিটাইজার দিয়ে পরিস্কার করে নিন;
৩. যেসব স্থান কোভিড-১৯ এ আক্রান্ত মায়ের সংস্পর্শে এসেছে সেসব জায়গা বা ব্যবহৃত আসবাবপত্রের উপরিতল নিয়মিতভাবে পরিষ্কার ও জীবাণুমুক্ত করুন;
৪. মা যদি কোভিড-১৯ এর কারণে বেশি অসুস্থ থাকেন এবং শিশুকে নিজে থেকে দুধদানে অক্ষম হন তবে মায়ের দুধ গালানোর মাধ্যমে পরিস্কার বাটি- চামচ ব্যবহার করে শিশুকে মায়ের দুধ দান করান;
৫. গুরুতর অসুস্থতার কারণে দুধ গালানো বা বের করা সম্ভব না হলে দাই মা বা কোনো স্তন্যদানকারী নারীকে খুঁজে বের করে দুধ পান করাতে উৎসাহিত করুন। এগুলোর কোনোটা একেবারেই সম্ভব না হলে শুধুমাত্র সেক্ষেত্রে রেজিস্টার চিকিৎসকের পরামর্শ অনুযায়ী মায়ের দুধের যথাযথ কোনো বিকল্প ব্যবহারের সম্ভাব্যতা খুঁজে বের করুন । পরবর্তীতে মা সুস্থ হয়ে ফিরলে শিশুকে পুণরায় মায়ের দুধ খাওয়ানো শুরু করুন।

আপনি যদি মা ও শিশু স্বাস্থ্যসেবার সাথে জড়িত থাকেন তবে:

- কোভিড-১৯ সংক্রমণে সনাক্তকৃত সকল গর্ভবতী নারী এবং নবজাতক ও ছোট শিশু রয়েছে এমন মায়েদেরকে স্তন্যদান বিষয়ক পরামর্শ সেবা, মনো-সামাজিক সহায়তা এবং স্তন্যদান বিষয়ক ব্যবহারিক সহায়তা এবং শিশুকে মায়ের দুধ খাওয়ানোর পদ্ধতি শিখিয়ে দিন ;
- মা অথবা তার শিশু কোভিড-১৯ সংক্রমণে সম্ভাব্য বা সনাক্তকৃত যে অবস্থাতেই থাকুক না কেন তাদেরকে বিশেষত প্রসবের পরপরই স্তন্যদানের অভ্যাস গড়ে ওঠার সময়গুলোতে একসাথে রাখা, ত্বকের সাথে ত্বকের নিবিড় সংস্পর্শে রাখা, ক্যাঙ্গারু মাদার পন্থা অবলম্বন এবং দিন-রাত পাশাপাশি রাখা ও এর অভ্যাস গড়ে তোলার সুযোগ করে দিন ;
- কোনভাবেই মায়ের দুধের বিকল্পকে (গুড়া দুধ, তরল দুধ) উৎসাহিত করবেন না। দুধের বোতল বা পিপুকে সান্ত্বনাকারী কোনো উপকরণ (যেমন: চুষনী) দিবেন না;
- কোভিড-১৯ নিয়ে মারাত্মক অসুস্থতা বা অন্যান্য জটিলতার কারণে কোন মা তার বাচ্চার যত্ন নিতে বা সরাসরি স্তন্যদান চালিয়ে যেতে না পারে তবে, সেসব মাকে যথাযথভাবে বুকের দুধ পালিয়ে নিয়ে নিরাপদে বাচ্চাকে খাওয়াতে উৎসাহিত করুন এবং প্রয়োজনীয় সহায়তা দিন। এক্ষেত্রে সাহায্যকারী হিসাবে একজন সুস্থ অর্থাৎ অন্য কোনো রোগে আক্রান্ত নয় এমন ব্যক্তি দায়িত্ব নিন এবং সংক্রমণ রোধে দরকারী পদক্ষেপ গ্রহণ করুন (মাস্ক পরুন মাকে স্পর্শ করার পরে হাত ভালো করে সাবান ও পানি দিয়ে ২০ সেকন্ড ধুয়ে অথবা অ্যালকোহল যুক্ত হ্যান্ড স্যানিটাইজার দিয়ে পরিস্কার করে নিন)।

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