

Dietary Guidelines for Bangladesh



**Bangladesh Institute of Research
and Rehabilitation in Diabetes, Endocrine
and Metabolic Disorders (BIRDEM)**



With the support of



National Food Policy Capacity Strengthening Programme



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Dietary Guidelines for Bangladesh



Quamrun Nahar, PhD
Senior Research Officer, BIRDEM

Subhagata Choudhury, MBBS, MPhil, FCPS
Director and Professor, Laboratory Services, BIRDEM

Md. Omar Faruque, PhD
Senior Research Officer, BIRDEM

Syeda Saliha Saliheen Sultana, MSc
Assoc Prof. Home Economics College, Dhaka

Muhammad Ali Siddiquee, PhD
Head, Grain Quality & Nutrition Division, BIRRI

Technical Contributions

Mohammad Abdul Mannan, PhD
National Food Utilization & Nutrition Advisor
National Food Policy Capacity Strengthening Programme, FAO

Lalita Bhattacharjee, PhD
Nutritionist
National Food Policy Capacity Strengthening Programme, FAO

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Abbreviations

AI	Adequate intake
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BMI	Body Mass Index
BNNC	Bangladesh National Nutrition Council
BIRDEM	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders
BRRl	Bangladesh Rice Research Institute
CHD	Coronary Heart Disease
CVD	Cardiovascular Disease
DDP	Desirable Dietary Pattern
FAO	Food and Agriculture Organization
FPMU	Food Planning and Monitoring Unit
HDL	High Density Lipoprotein
HIES	Household Income and Expenditure Survey
IDF	International Diabetes Federation
INFS	Institute of Nutrition and Food Science
IPHN	Institute of Public Health and Nutrition
LDL	Low Density Lipoprotein
Mg	Magnesium
MoHFW	Ministry of Health and Family Welfare
NCD	Non Communicable Disease
NFPCSP	National Food Policy Capacity Strengthening Programme
NPNL	Non Pregnant Non Lactating
µg	Microgram
P	Phosphorus
PAL	Physical Activity Level
PEM	Protein Energy Malnutrition
PUFA	Polyunsaturated Fatty Acids
RDI	Recommended Dietary Intake
RE	Retinol Equivalents
RI	Recommended Intake
TEE	Total Energy Expenditure
TFA	Trans Fatty Acid
USAID	United States Agency for International Development
WHO	World Health Organization

Preface

A balanced diet provides energy and nutrients for optimal growth, development and body maintenance. To achieve a balanced diet, you must eat a variety of foods from each of the food groups. This requires an understanding of how to improve dietary diversity and quality as well as wise food selection in planning meals. The most important step is to educate yourself about what your body needs and follow dietary guidelines which convert the scientific knowledge of nutrient requirements and food composition into practical messages so as to facilitate proper meal planning and consumption for nutritional well being.

Given the prevalence of under nutrition in the larger segments of the population and emerging problems of non communicable diseases in Bangladesh, the preparation of these guidelines is timely. This guide is an attempt to develop food based dietary guidelines for the general public and propose practical suggestions for better nutrition and health.

The guidelines have been developed based on an analysis of the dietary and nutrient adequacy of the food consumption of households using data from the 2010 Household Income Expenditure Survey. Many different sources of diet related information as well as regional guidelines have been reviewed and considered. The dietary guidelines have also been followed up from the guidelines published in 2000 by the Bangladesh National Nutrition Council, Ministry of Health and Family Welfare. The previous qualitative messages have been updated and quantitative messages have been included incorporating latest scientific evidence based information while at the same time, keeping the messages simple and easy to read.

The dietary guidelines developed by BIRDEM and other stakeholders will serve as an educational tool to express

nutrition principles in terms of foods and dietary practices that promote health and lower the risk for diet related diseases. In addition, they will contribute to the improvement of nutrition behavior in the population and serve as a tool to guide health, agriculture and food policies.


Prof. Nazim Nahar
Director General, BIRDEM

At the heart of good nutrition are dietary guidelines

Introduction

Although Bangladesh has made considerable progress in food (cereal) production, household and individual dietary diversity, child and maternal nutritional status continue to pose as challenges. The consumption of an ill balanced diet is known to play a key role in malnutrition and as a risk factor in chronic disease. Chronic diseases are largely preventable. Although, more research is needed on some aspects of the mechanisms that link diet to health, available evidence provides a basis to justify taking preventive action.

Dietary guidelines promote the concept of nutritionally adequate diets and healthy life style from conception to old age. This has been highlighted at many national and international levels and there was a general consensus that all countries should adopt food based dietary guidelines suitable for the country.

The dietary guidelines published by Bangladesh National Nutrition Council (BNNC) and other regional guidelines have been reviewed in the preparation of these guidelines. In 2000 BNNC, MoHFW in collaboration with multiple stakeholders formulated a set of qualitative dietary guidelines. The present dietary guidelines have been developed after extensive analysis of the HIES 2010 data, the food and nutrient intake pattern as well as the nutrition situation of Bangladesh.

In this document, food based approaches, using qualitative and quantitative messages have been incorporated. Emphasis is on positive recommendations which can maximize protective effects through the use of a variety of foods in tune with traditional habits. The goals set with respect to food items such as pulses, meat, fish, milk and vegetables/fruits are intended to encourage appropriate policy decisions. Suitable messages for each of the food

groups have been highlighted. A variety of foods, which are available and within the reach of the common people, can be selected to plan nutritionally adequate diets. Attempts are made to give portion sizes and food exchanges. Food based dietary guidelines emphasize the adequacy of intake of foods from all food groups for maintenance of optimal health. Large scale behavioral change campaigns should be launched to encourage people to follow dietary guidelines. Such efforts should be integrated with existing national nutrition, agriculture and health programs.

Policies and Strategies

Development and promotion of dietary guidelines were among the key activities outlined in the National Food and Nutrition Policy and National Plan of Action for Nutrition of Bangladesh 1997. This was further outlined in the National Food Policy 2006 and the ensuing National Food Policy Plan of Action 2008 -2015. It was proposed as one of the priority interventions in Programme 11 of the Country Investment Plan in Agriculture, Food Security and Nutrition (2011-2015). It is also outlined as one of the key activities in the Operational Plan of the National Nutrition Services (2011-2016).

Current nutrition situation

Among the Bangladeshi population, 22% children are born with low birth weight (LBW), over a third of children suffer from protein energy malnutrition: stunting 41%; wasting 16% and underweight 36%. Just over a fourth of women have chronic energy deficiency and half of them are deficient in zinc and iodine. About 8.4 million people are reportedly suffering from diabetes mellitus. The nutrition situation of Bangladeshi population has been summarized in table 1.

Table 1: Current Nutritional Status

Indicators		%	Year
LBW		22	2012 ^a
Child nutritional status-under 5	Stunting (height-for-age)	41	2011 ^b
	Wasting (weight-for-height)	16	2011 ^b
	Underweight (weight-for-age)	36	2011 ^b
Anaemia	NPNL women	26	2011 ^c
Anaemia	Under 5	33.1	2011 ^c
Zinc deficiency	Under 5	44	2011 ^c
Zinc deficiency	(NPNL women)	57.3	2011 ^c
Iodine deficiency	(NPNL women)	42.1	2011 ^c
Diabetes Mellitus	Adult	7.9	2011 ^d
Obesity: BMI > 25	Adult	17.9	2010 ^e

^aWHO, ^bBangladesh Demographic and Health Survey, ^cNational Micronutrient Survey, ^dInternational Diabetes Federation
^eNCD Risk Factor Survey, Bangladesh

Goals of dietary guidelines

- Improve nutritional status of the Bangladeshi population and prevent nutritional deficiency diseases.
- Ensure adequate nutritional status of pregnant and lactating women.
- Prevent and control chronic diet-related disorders.
- Maintain health of the elderly and increase life expectancy.

Population nutrient intake goals

The population nutrient intake goals represent the population average intake that is consistent with the maintenance of health in a population. The population nutrient intake goals considered by national and regional bodies establishing dietary recommendations for the prevention of diet related chronic disorders are given in Table 2:

Table 2: Ranges of population nutrient intake goals¹

Dietary factor	% of total energy
Total fat	15-30%
Saturated fatty acids	<10%
Polyunsaturated fatty acids (PUFAs)	6-10%
n-6 Polyunsaturated fatty acids (PUFAs)	5-8%
n-3 Polyunsaturated fatty acids (PUFAs)	1-2%
Trans fatty acids	<1%
Total carbohydrate	55-75%
n-6: n-3	5:4
Free sugars	<10%
Protein	10-15%
Cholesterol	<300 mg per day
Sodium chloride (sodium)	<5 g per day (<2 g per day)
Fruits and vegetables	≥ 400 g per day

¹ (WHO/FAO 2003, Diet, Nutrition and the Prevention of Chronic Diseases, WHO Technical Series 916)

Dietary guidelines for the Bangladeshi population

Dietary guidelines are sets of advisory statements providing principles and criteria of good dietary practices to promote national wellbeing. They are intended for use by individuals.

The following advisory statements indicate what type of foods have to be consumed, the extent to which they have to be consumed, including the use of spices, condiments and water. It also suggests the use of healthy preparation and cooking methods for the retention of nutrients and to promote better health.

1. Eat a well-balanced diet with a variety of foods at each meal;
2. Use in moderation foods high in fat and minimize fats and oils in food preparation;
3. Limit salt intake and condiments and use only iodized salt;
4. Take less sugar, sweets or sweetened drinks;
5. Drink plenty of water daily;
6. Consume safe and clean foods and beverages;
7. Maintain desired body weight through a balanced food intake and regular physical activity;
8. Adopt and follow appropriate preparation and cooking practices and follow healthy eating habits;
9. Eat additional food and take extra care during pregnancy and lactation;
10. Practise exclusive breastfeeding for the first six months of life; introduce appropriate complementary foods after completion of 6 months and continue complementary feeding along with breastfeeding up to 2 years.

DESCRIPTION OF DIETARY GUIDELINES



EAT A WELL-BALANCED DIET WITH A VARIETY OF FOODS AT EACH MEAL

**Eat adequate amount of cereals and cereal products
and preferably whole grain cereals daily**



Popular cereals in Bangladesh are rice and wheat. Rice is the principal source of energy and a good source of B complex vitamins. Rice products such as rice flakes, puffed rice and rice flour are also commonly eaten foods. The next rich source of energy is wheat. Wheat is rich in essential minerals like calcium, magnesium, potassium, manganese, zinc, copper and B complex vitamins. Parboiled, unpolished, unrefined brown rice and whole wheat flour contain higher amount of nutrients and dietary fibre that are beneficial to health. Whole grain cereals also help to reduce the risk of gall stones, heart disease, colon cancer and many other illnesses. Whole wheat and unrefined cereals have low glycemic index

(GI) that is good for health. A daily consumption of 9 to 15 serving of cereals is recommended of which 8-12 should come from rice and 1-3 can come from wheat.

Key Messages

- Eat rice or wheat or a combination of cereals around 270-450 g which is equivalent to 9-15 servings daily.
- Eat rice or roti with legumes or fish / poultry/ egg every day for better nutritional value.
- Do not discard water from cooked rice as it contains water soluble vitamins.
- Try to consume unpolished/ brown rice and whole wheat atta because it contains nutrients such as protein, fat, dietary fibre, minerals and vitamins.

Consume required amounts of fish, meat, poultry, egg and legumes daily



Fish, meat, poultry, egg, legumes and pulses are good sources of protein which are needed for growth, body function and maintenance. Protein is also needed to improve

immune response and supply of energy. Sea fish has high concentration of omega 3 fatty acids, vitamin D and B2 which are beneficial to health. Small bony fish which can be eaten whole are good sources of calcium for strong bones and teeth. Meat and poultry are a rich source of vitamins like niacin and riboflavin and minerals like calcium, zinc and copper which have protective and regulatory functions in the body. Eating fish regularly instead of red meat helps reduce blood cholesterol. Eating lean meat is more beneficial as a source of protein and it also reduces fat accumulation in blood vessels and the body as a whole. Frequent consumption of meat that has visible fat should be avoided.

Egg is an affordable source of high quality protein. It is a powerhouse of disease-fighting nutrients like protein, lutein, choline, iron and vitamin D.

Pulses and legumes are also a good source of protein. They contain a wide range of nutrients, including carbohydrate, dietary fibre, vitamins and minerals, as well as non-nutrients, such as antioxidants and phytoestrogens that are beneficial to health. Chickpeas and lentils contain saponins that help to lower blood cholesterol. Pulses include, lentils (mosur dal), peas, chick pea/Bengal gram (chholar dal), black gram (mashkalai dal), mung beans and other legume crops. Pulses are gluten-free and can be used in diets for celiac disease, a gastro-intestinal disorder. Meat/ poultry/ eggs are good sources of haem iron. Children can eat one egg a day while normal adults can take 2 to 3 eggs per week.

Key messages

- Eat 1 to 4 medium size pieces of fish, meat, poultry and 1/3 to 1/2 cup of pulses daily.
- Combine cereals with legumes in the ratio of 3:1.

Eat plenty of fruits and vegetables everyday



Vegetables and fruits are good sources of vitamins, minerals and dietary fibre. Dark green leafy vegetables, yellow orange vegetables and fruits are especially good sources of dietary fibre, folate, and a wide range of carotenoids and vitamin C. Fibre in vegetables and fruits help to remove waste as well as eliminate excess cholesterol and some carcinogenic compounds. Regular consumption of these foods helps to prevent vitamin A deficiency and anemia. Research has shown that beta carotene and vitamin C in vegetables and fruits can prevent fat from depositing in blood vessels and also reduce the risk of some types of cancer. Bangladesh is fortunate in having a wide range of leafy vegetables and local seasonal fruits. They should be taken regularly as part of the diet, and especially of children and adolescents to keep them strong and healthy. It is suggested that everyone should eat a variety of vegetables during every meal, take fruits regularly, and especially after meals or as a snack. They should be taken according to seasonal availability.

Key messages

- Eat 2 seasonal fruits everyday, one from citrus, another from vitamin A sources.
- Eat a citrus fruit after a meal to enhance iron absorption.
- Eat at least 100g leafy and 200g non-leafy vegetables daily.

Consume adequate amounts of milk and milk products



Milk is a good source of calcium and phosphorus which are essential for building strong bones and teeth. Milk also contains protein, lactose and vitamins (especially vitamin B₁₂) which promotes growth and proper functioning of body tissues. Consumption of milk is essential for young children and adolescents for building maximum peak bone mass. Milk consumption also helps to prevent osteoporosis in later life. It is essential in pregnancy and lactation for the skeletal and dental health of both the mother and the baby. In our country cow, goat and buffalo milk is popular.

Key messages

- Take at least one cup (150 ml) milk or one cup (100 ml) milk product such as plain curd or *doi* as a good source of calcium for healthy bones and teeth.
- Eat curd or drink soya milk in case there is lactose intolerance. Curd contains bacteria that are beneficial to the body and can help digest lactose in milk.
- Fat free or skim milk is recommended for health, especially for older adults.



CONSUME MODERATE AMOUNTS OF OILS AND FATS



Fats and oils are essential foods for health, supplying energy. Oils and fats from plant and animal sources are concentrated sources of energy and provide 9 kcal per gram. In our country, different types vegetable oils like soybean, mustard and rice bran oil are used as cooking oil in food preparation. Ghee and butter are also used occasionally. Fats in foods provide essential fatty acids and helps absorption of fat soluble vitamins A, D, E, and K. Some fats are a source of antioxidants which are known to reduce the risk of some cancers and chronic heart disease. Apart from these, fats contribute to texture, flavor and taste, and therefore improve the palatability of meals. Cholesterol in fat is an essential component that is needed in small amounts for brain development. Cholesterol is present only in foods of animal origin such as whole cream milk, butter, ghee, egg, meat and organ meats, shrimp and prawn and not in plant foods. There are two kinds of fat: saturated and unsaturated. Saturated fat comes from meat and animal skin, vanaspati, ghee, butter and coconut

oil. Consuming too much saturated fat will increase cholesterol levels in blood leading to a greater risk of cardiovascular disease. To prevent this, saturated fat should be limited, especially in adults. Fish oil is a source of omega 3 fatty acids that confer nutritional and health benefits. Fast foods, bakery products and junk food contain unhealthy trans-fat that can raise your LDL cholesterol just like saturated fats. They also increase inflammation and lower the HDL cholesterol that protects against heart disease. The recommendation for cholesterol is no more than 300mg per day.

Key Messages

- Vegetable oil, like mustard and soybean oil should be used in moderation daily instead of ghee, butter, and palm oil.
- Use only the required amount of cooking oil.
Recommended daily intake is 30g per person per day of visible fat.
- Limit intake of deep fried foods and oily snacks.
- Limit intake of high fat bakery products (cake, pastries), fast foods, (hot dog, burger), rich foods (*Biriani, Kachhi*), processed meat, grilled chicken etc. as they contain trans fats that are bad for health.

Box 1

Recommendations on the type of fat for a healthy diet across the life span

- Total fat should provide between 15-30% of the daily energy intake.
- Saturated fat should provide less than 10% of the daily energy intake.
- Poly unsaturated (omega 3 and omega 6) fats should contribute 6-10% of the daily energy intake.
- Intake of trans fat should be less than 1% of the daily energy intake.
- Remainder of the energy from fat can be provided by mono unsaturated fats.
- Cholesterol intake should be less than 300mg/ day.
- Omega 6 to Omega 3 ratio should be 5:4 in the diet.

GUIDELINE
3

LIMIT SALT INTAKE AND
CONDIMENTS AND USE
ONLY IODIZED SALT



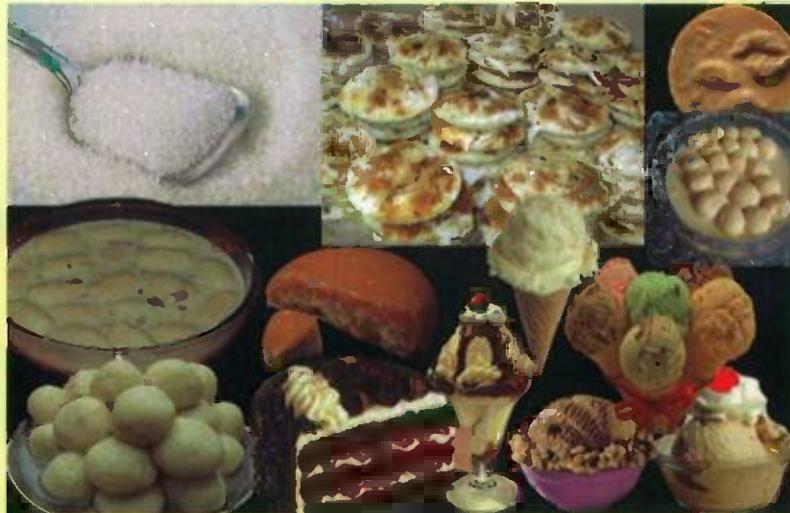
Sodium is found in most foods as sodium chloride, generally known as 'salt'. Sodium is an essential nutrient for normal cellular metabolism. Dietary salt contain 97 to 99% sodium chloride. One teaspoon of salt provides around 400 mg of sodium. It is also present in the diet as sodium bicarbonate (baking soda) and as monosodium glutamate in processed foods, in additives such as sodium phosphate, sodium carbonate and sodium benzoate. Too much or too little salt in the diet can lead to muscle cramps, dizziness, or electrolyte disturbance. A high salt intake is a major risk factor for hypertension or elevated blood pressure. It is estimated that Bangladeshi people consume about 10g salt (2 tea spoons) per capita per day. Foods that are rich sources of sodium include salted Hilsha, dry fish, cheese, table salt, pickles, fish sauce, ketch up, soya sauce, chips and wafers.

Key messages

- Limit salt intake to less than one teaspoon a day.
- Use only iodized salt.
- Limit consumption of highly salted / sodium rich foods like chips, biscuit, wafers and condiments.
- Limit extra table salt with meals.

GUIDELINE
4

TAKE LESS SUGAR, SWEETS OR SWEETENED DRINKS



Sugar is a concentrated form of energy. Sugar consists of simple carbohydrates. Sugar is mainly used to sweeten food and beverages like tea, coffee and desserts. A high intake of sugar may also contribute to excess energy intake leading to obesity, which in turn is a risk factor for coronary heart disease and diabetes mellitus. There is a link between sugar consumption and dental caries. Children who eat sugary foods often have a lower appetite and are prone to tooth decay. Honey and molasses also provide sugar but are better for health than refined sugar. Less than 10% of total energy should be provided from free sugars.

Key messages

- Consume not more than 25g (5 teaspoons) of sugar per day.
- Refined sugar is known as a dietary disaster and it is advisable to reduce the intake of sugar based foods especially sweetmeats and rich desserts.
- Encourage the intake of natural sugars from a variety of seasonal fruits.
- Limit consumption of foods rich in hidden sugar and foods with added sugar e.g. confectionery, biscuits, cakes, jams, jelly, marmalades, chocolates, toffee, candy and sweets.

GUIDELINE
5

DRINK PLENTY OF WATER DAILY



Water is an essential nutrient. All biochemical reactions occur within the water components in our body. Water is also required for digestion, absorption, transportation, dissolving nutrients, elimination of waste products and thermo-regulation. Infants exclusively fed breast milk do not require supplemental water. A pregnant woman has slightly increased water requirements because of expanding extracellular fluid space, the needs of the fetus and the amniotic fluid. A lactating woman must drink extra water to replace the fluid lost in breast milk.

Key messages

- Drink 1.5 to 3.5 liters (6-14 glasses) pure drinking water daily.
- Drink coconut water and fresh fruit juices instead of carbonated drinks.



CONSUME SAFE AND CLEAN FOODS AND BEVERAGES

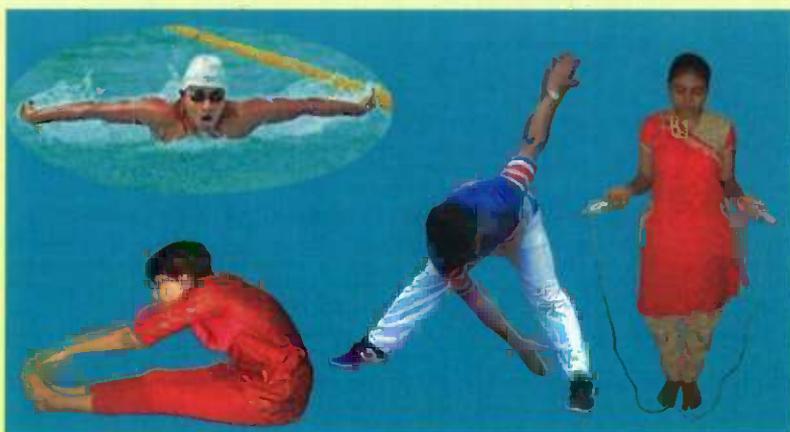
Consumption of unsafe food can cause severe illness and even death. Aflatoxins of bacteria and moulds spoil the food. Natural enzymes present in food also lead to its deterioration. Besides insects and rodents, adulterants, wrong storage methods and non-permitted food additives make the food unsafe. Spoilt, stale, poor quality of food is made attractive by adding harmful chemicals and colors. Street food is not considered as safe food especially when prepared and sold in unhygienic condition. Awareness and knowledge regarding food selection, labelling, food storage, food handling and good personal hygiene during food preparation help to maintain food safety and good health. Perishable foods like fish, meat and vegetables need to be refrigerated and stored properly. Open cuts and wounds and poor personal hygiene can be a source of contamination. Dust and flies also contaminate the food, so it should always be kept well-covered.

Key messages

- Buy food items from reliable sources after careful examination.
- Refrigerate perishable food items till consumption.
- Keep foods well covered from dirt and flies
- Avoid eating street foods that are contaminated with polluted water and dust



MAINTAIN DESIRED BODY WEIGHT THROUGH A BALANCED FOOD INTAKE AND REGULAR PHYSICAL ACTIVITY

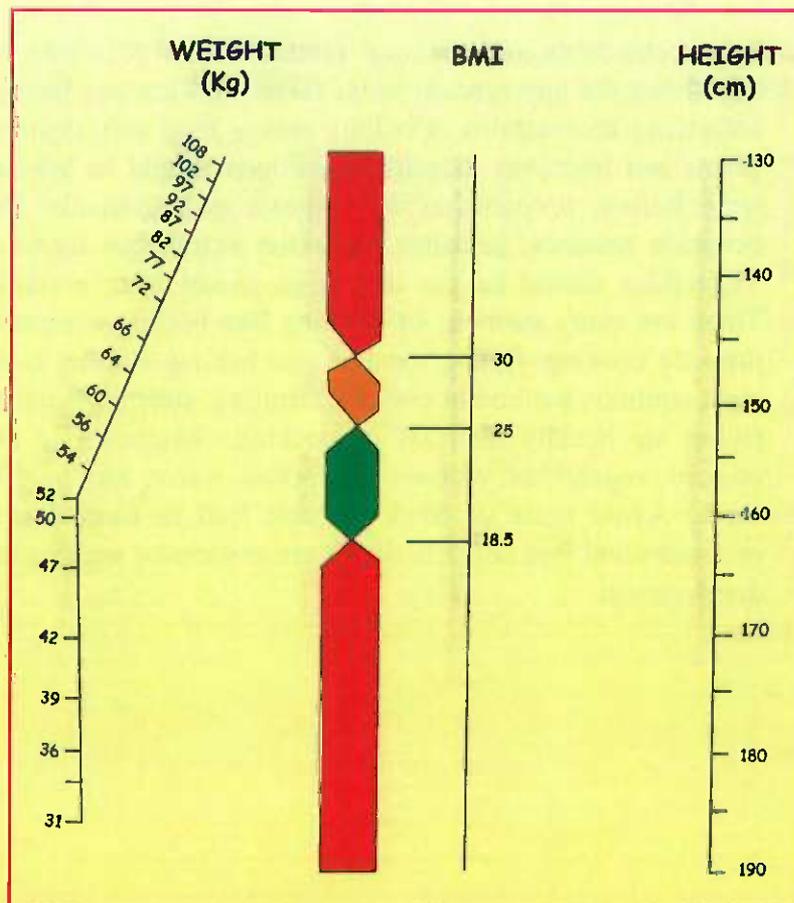


It is recommended that all healthy individuals engage in adequate levels of physical activity throughout their lives to achieve overall physical, mental, social and spiritual health. Many of the diet-related chronic diseases are closely linked to poor activity patterns. Being physically active from an early age prevents many diseases and disabilities in adulthood. Exercise improves oxygen utilization, clears blood glucose and increases working capacity.

Key messages

- **Maintain ideal body weight by balancing food consumption with physical activity.**
- **Practice minimum 30 to 45 minutes of daily physical activity like walking, running, jogging, cycling and household work.**
- **Maintain Body Mass Index (BMI, 18.5- 23.0).**
- **Avoid risk of obesity-related metabolic complications (waist circumference >90 cm for male and >80 cm for female is a risk).**
- **Maintain healthy waist-hip ratios (male 0.9; female 0.8).**
- **After a meal, engage in light activity like household chores and walk whenever possible.**

BMI is a useful indicator* for the assessment of body fatness. The following normogram is proposed as reference:



Normogram for determining BMI

Source : NIN, ICMR, 2006

* Recently WHO proposed the upper cut off point of BMI 23.0 for Asians.



PRACTISE HEALTHY LIFE STYLE WITH RIGHT COOKING AND HEALTHY EATING

Proper methods of cooking render foods palatable by improving the appearance, taste, flavor and texture, thereby enhancing acceptability. Cooking makes food soft, destroys germs and improves digestibility. Foods should be washed well before preparation to remove contaminants like pesticide residues, parasites and other extraneous material. Vegetables should be cut into large pieces after washing. There are many methods of cooking like boiling, steaming, pressure cooking, frying, roasting and baking. Boiling is the most common method of cooking. Boiling, steaming and stir frying are healthy methods of cooking. Steamed rice and cooked vegetables without discarded water are healthy foods. Avoid reuse of fried oils that lead to formation of peroxides and free radicals which are associated with cancer development.

Key messages

- Eat food timely and avoid over eating.
- Eat food with proper chewing.
- Steamed food is more nutritious.
- Wash vegetables and other foods before cutting.
- Cut vegetable into larger pieces.
- Do not expose vegetables and fruits in air and water after cutting.
- Cook foods in vessels covered with a lid.
- Use HTST (high temperature short time) method for cooking vegetables.
- Avoid reheating food more than once.
- Avoid reuse of fried oils.
- Avoid faulty food beliefs, fads and fallacies.
- Avoid sleeping immediately after a major meal.
- Avoid smoking, alcohol consumption and betel nut chewing.
- Take sound sleep 6-8 hrs everyday.
- Take clinical checkup at least once a year.



EAT ADDITIONAL FOOD DURING PREGNANCY AND LACTATION

Pregnancy and lactation are the most nutritionally demanding periods of a woman's life. The body needs enough nutrients every day to support the growth of the baby and the maintenance of the mother's body. All the nourishment the developing baby needs comes from the mother, through the foods she eats, the supplements she takes and the care that she receives. The average weight gain during pregnancy is about 12 kg (range 10-14 kg) for a healthy pregnancy.

Key messages

- Eat beef, mutton or poultry or germinated pulses throughout pregnancy for best iron sources.
- Eat seasonal fruits throughout pregnancy, especially after meals.
- Iron supplements are poorly absorbed when they are taken with beverages such as coffee or tea or simultaneously with calcium supplements. They should be taken after a meal, preferably after breakfast or after lunch.
- Maintain proper weight gain during pregnancy.



PRACTISE EXCLUSIVE BREASTFEEDING FOR SIX MONTHS AND START APPROPRIATE COMPLEMENTARY FOODS IN TIME

Breastmilk is the ideal food for infants. The World Health Organization recommends exclusive breastfeeding for the first six months, when no other food or fluid is required. Breast-milk is the most natural and perfect food for normal growth and healthy development of infants. It reduces the risk of infections and prolongs birth interval by fertility control.

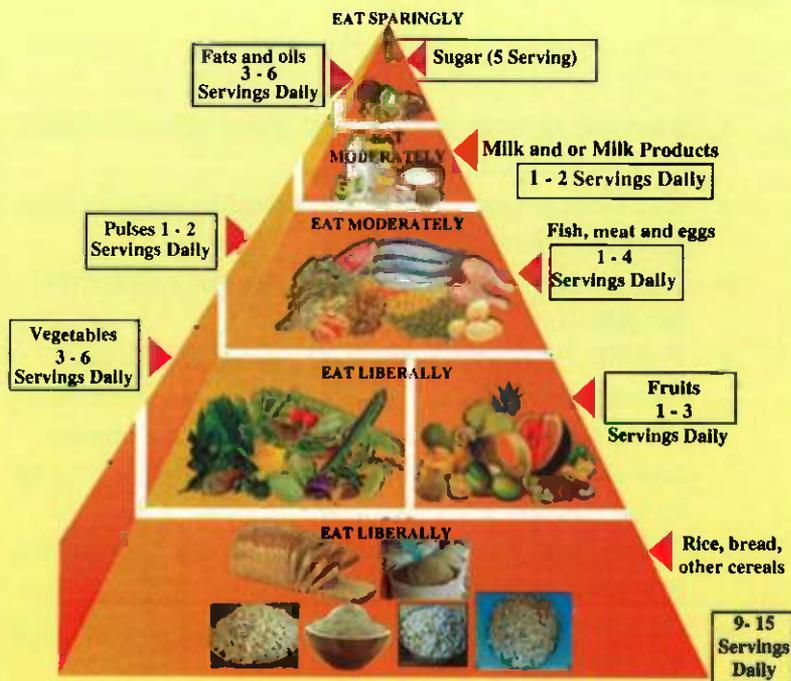
Key messages

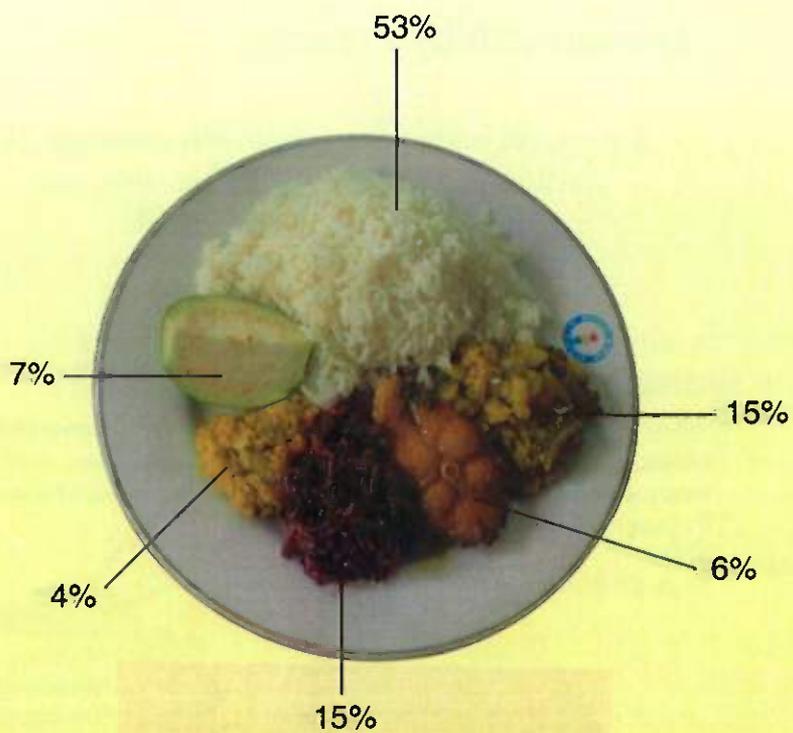
- Start breast-feeding as soon as the mother recovers from delivery, usually, an hour
- Exclusively breast feed for six months for adequate growth of the child.
- Ensure active family support, time and rest for the mother.
- Practise exclusive breastfeeding for the first six months of life; introduce appropriate complementary foods after completion of 6 months and continue complementary feeding along with breastfeeding up to 2 years.
- Choose home-made complementary foods when the baby sits up with support
- Do not give sweet drinks such as soda, as it can lead to tooth decay.
- Avoid smoking, tobacco, alcohol and drugs during breastfeeding

Food Guide Pyramid for Bangladeshi Populations

The following food guide pyramid includes both qualitative and quantitative guidelines. The base of the pyramid includes cereal based foods which are recommended in maximum portions for consumption. The middle part of the pyramid indicates the required servings from different food groups (vegetables, fruits and meat/fish). The top of the pyramid recommends that minimum portions should be eaten from sugar, sugar products and fat foods.

FOOD PYRAMID

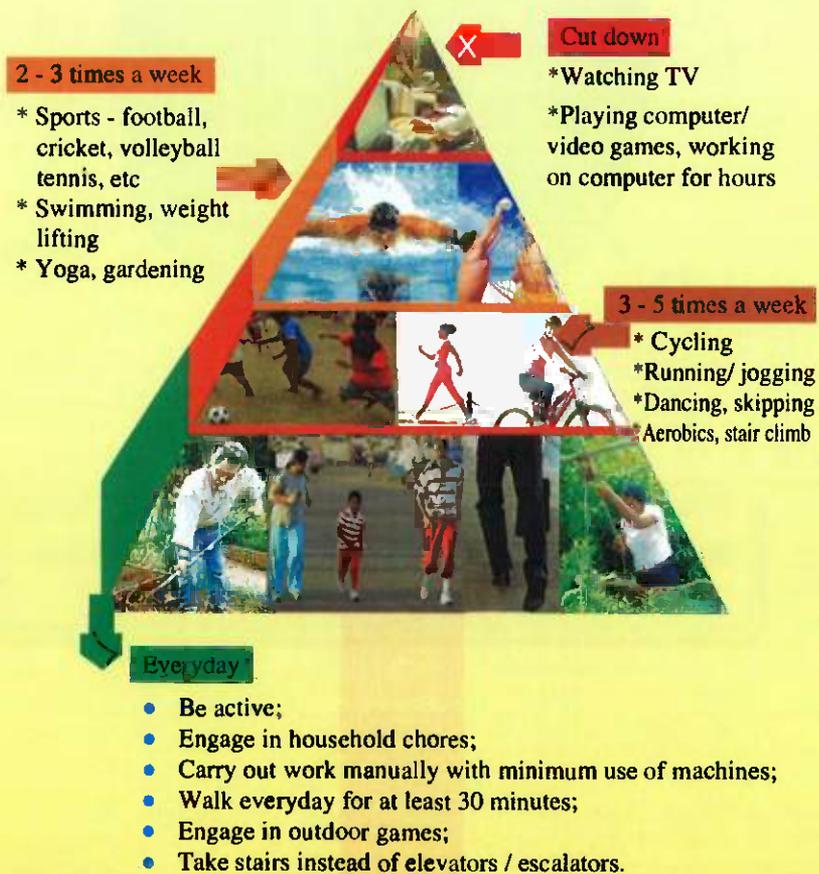




Food plate method: Proportion of foods for a healthy diet (Lunch)

Physical Activity Pyramid

A physical activity pyramid will guide on the duration and type of activities that are important for a healthy life



Self-evaluation of Food Based Dietary Guidelines

Keeping in mind the 10 rules of dietary guidelines for good health of Bangladeshi people, it is now time to evaluate your own eating behaviors and related practices.

Place a check mark for your answer in the space provided in accordance with your past eating behavior.

Eating behavior and related issues	Frequency of eating		
	Regular	Occasionally	never
1. Eat a variety of food from 6-8 food groups of food pyramid			
2. Eat unpolished rice, wheat			
3. Eat citrus and vit A rich fruits			
4. Eat vegetables (leafy & non leafy)			
5. Eat fish/meat			
6. Eat pulses			
7. Eat foods containing fat and oils			
8. Eat sweetened foods			
9. Drink milk			
10. Eat fresh, well prepared foods			
11. Avoid overeating			
12. Eat food with proper chewing			
13. Always wash hands before meals			
14. Have your body weight measured weekly			
15. Perform exercise			
16. Undertake clinical check-up at least once a year			
17. Take enough rest and sleep			

* Occasionally - 3 days/week; Never - less than 3 days/week

Evaluation score

Good	Moderate	Poor
15-17	11-14	<10

Standardization of weights and measures for foods

The standard measuring cups, bowls and spoons, used at BIRDEM Hospital, Dhaka have been adapted for standardizing serving sizes. The approximate energy value (kcal) of each of the servings is also provided.



200g cooked vegetable
(2 servings) provide 100 kcal



100g banana (1 serving) provides 95 kcal
50g egg (1 serving) provide 70 kcal



100g cooked rice (1 serving)
provides 100 kcal



10ml oil (2 servings) provide
90 kcal



100ml thin cooked dal (1 serving)
provides 50 kcal



150ml milk (1 serving) provides
100 kcal



80g cooked fish (1 serving)
provides 100 kcal

Food Exchange List

An exchange list is a grouping of foods based on similarities in energy content as well as carbohydrate, protein and fat.

Each serving of grains, fish, meat and oil provides 100 kcal; fruits and vegetables provide 50 kcal

Food	Serving size	g/ serving	Portion size (uncooked)	kcal
• Rice	8-12	30	1/3 cup	100
• Wheat	1-3	30	1/3 cup	100
• Potato	1-4	50	1 medium	50
• Lentil	1-2	30	1/3 cup	100
• Leafy vegetables	1-2	125	1 bunch	50
• Vegetables	2-3	150	1.5 cup	50
• Fruits	1-3	80	1	50
• Fish/ meat/ poultry	1-2	80	2 pieces	100
• Egg	1	60	1	100
• Milk	1-3	150	1 cup	100
• Sugar	1-5	5(1 tsp)	5 tsp	100
• Cooking Oil	3-6	5 g	2 tsp	100
• Spices*	1	20 g	4 tsp	50

* Spices includes onion, garlic, ginger, turmeric and chilli.

Desirable diet for Bangladesh

A desirable dietary intake has been proposed after the evaluation of previous work and current consumption patterns of the population.

Table 3: Desirable food intake for Bangladeshi population

Food	Yusuf et al, 1996 (2310kcal)		National Experts, 2007 (2350 kcal)		DDP, 2013 (2430kcal)	
	Desirable intake (g)	%of total Energy	Desirable intake (g)	%of total Energy	Desirable intake (g)	%of total Energy
Total Cereal	372	55	375	55	400	56
Rice	312	46.6	350	51	350	49
Wheat & other cereals	60	8.4	25	4	50	7
Pulses	66	10	60	8.8	50	6.5
Animal foods	126	5	180	7.0	260	10.5
Fish	50		55	2.1	60	3
Poultry & meat	22		35	1.4	40	2
Egg	7		15	0.6	30	2
Milk & milk products	47		75	2.9	130	3.5
Fruits	57	2.5	100	4.2	100	3
Vegetables	Leafy				100	2
	Non-leafy	132	2.5	200	3.6	200
Potato	130	5	60	2.5	100	4
Cooking oil	38	15	40	15.3	30	11
Sugar/Gur/Molasses	28	5	18	3.2	20	3
Spices	10		20	0.4	20	2
Total	959	100	1053	100	1280	100

Menu planning

Meal plans have been developed considering the body weight, physical activity level, physiological status, food cost and dietary diversity scores. The following menu with moderate cost has been developed for a woman engaged in moderate activity.

Adult man

Age : (19-29 years)
Activity level : Moderate
Present energy requirements : 2430 kcal/day.
Weight : 60 kg

Determine the quantity (g) of carbohydrate, fat and protein on the basis of energy requirements

Step 1

70% of the kcal from carbohydrate.

20% of the kcal from fat.

10% of the kcal from protein.

100%

For 2430 kcal, the division of nutrients translate as follows:

Carbohydrate:

$70\% \times 2430 \text{ kcal} = 1701 \text{ kcal}$; $1701 \text{ kcal} \div 4 \text{ kcal/g} = 425 \text{g}$.
(So the man needs 425g carbohydrate).

Fat:

$20\% \times 2430 \text{ kcal} = 486 \text{ kcal}$; $486 \text{ kcal} \div 9 \text{ kcal/g} = 54 \text{g}$.
(So the man needs about 54g fat).

Protein:

$10\% \times 2430 \text{ kcal} = 243 \text{ kcal}$; $243 \text{ kcal} \div 4 \text{ kcal/g} = 61 \text{g}$.
(So the man needs about 60g protein)

MENU PLAN

Age (Yrs) : 25
 Height (cm) : 182
 Weight (kg) : 80

Gender : F
 P.A.L : 1.5
 BMR (Kcal / Kg / Day) : 27

Calorie Requirement (Kcal) : 3430
 Carbohydrate : 70 % (1701 Kcal)
 Protein : 10 % (343 Kcal)
 Fat : 20 % (486 Kcal)

Breakfast: 7am, Snacks: 11am

Food Name	Quantity (g)
Wheat flour (coarse)	60
Bengal gram (split)	15
Ground (lentils)	125
Spices	5
Oil mustard	10
Breakfast	
Banana, ripe, combined different varieties, raw	100
Rice (polished)	50
Molasses	10
Snacks	

Lunch : 1pm, Snacks: 4pm

Food Name	Quantity (g)
Rice, parboiled	150
Potato	50
Lady's finger/okra	125
Chandling Fish	30
Indian spinach	10
Spices	10
Oil mustard	10
Lunch	
Molasses	10
Watermelon	100
Rice (polished)	30
Snacks	

Dinner: 8pm, Bed time : 11pm

Food Name	Quantity (g)
Rice, parboiled	120
Ground (beans)	125
Chicken (red meat)	140
Chicken (lean)	40
Spices	10
Oil mustard	10
Dinner	
Whole milk (Cow)	130
Bed time	

Food List and Nutrient Value

Food Name	Qty (g)	Fiber (g)	Energy (kcal)	Energy (kj)	Protein (g)	Fat (g)	CHO (g)	Ca (mg)	Iron (mg)	VR B1 (mg)	VR B2 (mg)	VR C (mg)	Req (µg)	VR B3 (mg)	Folate (µg)	Zinc (µg)	Mg (mg)	Na (mg)	K+ (mg)	Phos (mg)
Rice (polished)	50	0.65	178	735	3	0.57	40	13	3.40	0.10	0.02	0	0	2.00	0.00	1	23	1	75	65
Rice (polished)	30	0.41	108	462	2	0.30	25	3	2.04	0.06	0.04	0	0	1.05	0.00	0	14	0	46	40
Wheat flour (coarse)	60	60.62	200	846	7	1.25	37	31	2.54	0.28	0.17	0	0	3.72	17.40	2	91	11	170	140
Rice, parboiled	270	11.34	923	3815	18	1.08	205	24	1.88	0.57	0.14	0	0	12.42	29.70	4	116	5	394	340
Bengal gram (split)	15	0.16	56	237	3	0.91	9	5	1.53	0.07	0.04	0	0	0.36	22.12	1	17	6	109	50
Lentils	20	2.64	63	268	4	0.34	0	5	1.02	0.16	0.02	0	1	1.26	7.20	1	14	7	127	52
Amaranth (red leaf)	100	4.23	32	131	5	0.34	0	256	6.00	0.03	0.13	42	793	1.60	85.00	1	181	59	261	32
Indian spinach	100	2.18	25	105	2	0.31	2	111	2.20	0.02	0.06	52	170	0.50	140.00	0	179	69	187	31
Spices	25	0.46	61	0	2	1.75	8	6	0.22	0.00	0.03	1	1	0.08	4.75	0	6	3	53	7
Potato	50	1.03	33	140	1	0.08	7	6	0.20	0.04	0.05	10	1	0.40	8.00	0	10	8	143	20
Ground (bottle)	125	0.75	42	178	1	0.12	6	33	0.91	0.01	0.02	11	2	0.50	7.50	1	14	49	188	68
Ground (lentils)	125	1.00	30	128	1	0.36	6	39	0.47	0.05	0.06	23	0	1.00	20.00	0	21	49	194	35
Lady's finger/okra	125	3.88	49	205	3	0.20	7	118	1.12	0.05	0.20	22	24	1.75	75.00	0	25	46	223	35
Oil mustard	30	0.00	270	1110	0	30.00	0	0	0.00	0.00	0.00	0	0	0.00	0.00	0	0	0	0	0
Banana, ripe, combined	100	2.90	95	400	1	0.84	19	11	0.30	0.04	0.08	1	2	0.80	20.00	0	23	10	411	36
Watermelon	100	1.81	16	67	0	0.20	2	12	0.38	0.02	0.04	11	29	0.33	3.00	0	11	17	107	12
Chandling Fish (fish)	30	0.00	42	174	5	2.31	0	19	0.36	0.01	0.05	0	65	0.78	0.00	0	16	16	64	48
Chicken (lean)	40	0.00	50	0	7	2.26	1	1	0.83	0.00	0.00	0	0	0.00	0.00	0	5	47	80	3
Whole milk (Cow)	130	0.00	82	342	4	4.86	6	134	0.12	0.08	0.36	3	41	11.05	11.05	1	29	67	171	117
Molasses	20	0.00	77	326	0	0.02	19	1	0.05	0.00	0.00	0	0	0.00	0.00	0	0	1	0	2
Total:	1545	38.46	2433	8791	70	47.87	410	849	23.81	2.50	1.83	178	1128	29.89	455.21	12	794	665	3062	1175
RDA:	36.00	2430	62	55.80	1000	27.40	1.20	1.20	45	600	18.00	400.00	7	280	2062	3750	700			

Breakfast: 1/2 cup (medium thick), gourd (small) 1/2 cup, 1/2 medium amaranth; Banana 1 medium, flattened rice 1/2 cup, Lunch: Rice 5 cup, fish 1 piece (small), vegetable (potato, Indian spinach, ladies finger) 1 1/4 cup, Afternoon: Watermelon 1 cup (1 medium size), rice (polished) 1 cup with molasses, Supper: Rice 4 cup, vegetables (potato, gourd, amaranth) 1 1/2 cup, chicken 1 piece (small), Bed time: 1 cup milk.

FOODS : 10 Out of 12 food groups Food Price: 82 TL

**Nutrient Requirements:
Protein, fat and fibre requirements in different age groups for both male and females**

Age (yrs)	Body weight (kg)		Protein g/day (FAO 2007)		Total Fat (% of total Energy) (FAO-2008)		Fiber g/day	
	Male	Female	Male	Female	Male	Female	Male	Female
<1	7.47	6.91	10.2	9.4	40-60	40-60	No AI has been set	No AI has been set
1	11.43	10.79	11.6	10.8	35	35	14	14
2	13.51	13	11.9	11.4	35	35	14	14
3	15.67	15.06	13.1	12.7	25-35	25-35	14	14
4-6	17.69-18.46	16.81-17.81	17.1	16.2	25-35	25-35	18	18
7-8	20.37-22.55	19.76-22.09	25.9	26.2	25-35	25-35	18	18
9-10	25-27.8	24.82-28.21	25.9	26.2	25-35	25-35	24	20
11-14	30.88-43.96	32.36-43.22	40.5	41	25-35	25-35	24	20
15-18	49.87-45-75	44.99-40-75	57.9	47.4	25-35	25-35	28	22
19-50	45-75	40-75	33-66	33-66	20-35	20-35	30	25
51-65+	45-75	40-75	33-66	33-66	20-35	20-35	30	25
Pregnancy (1 st trimester)				+1				25-28
Pregnancy (2 nd trimester)				+10				25-28
Pregnancy (3 rd trimester)				+31				25-28
Lactation (0-6 Month)				+19				27-30
Lactation (7-12 Month)				+13				27-30

AI, Adequate Intake

Vitamin requirements in different age groups for both male and females

Age (yr)	Body weight (kg)		Vit-A µgRE/d (FAO-2004)		Thiamine mg/day (FAO-2004)		Riboflavin mg/day (FAO-2004)		Niacin mg NEs/day (FAO-2004)		Vit-B12 µg/day (FAO-2004)		Folate µgDFE/day (FAO-2004)		Vit-C RNI mg/day (FAO-2004)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<1	7.47	6.9	375-400	375-400	0.2-0.3	0.2-0.3	0.3-0.4	0.3-0.4	2-4	2-4	0.4-0.7	0.4-0.7	80	80	25-305	25-305
1-3	11.4-15.7	11-15	400	400	0.5	0.5	0.5	0.5	6	6	0.9	0.9	150	150	305	305
4-6	17.7-18.5	17-18	450	450	0.6	0.6	0.6	0.6	8	8	1.2	1.2	200	200	305	305
7-9	20.4-25	20-25	500	500	0.9	0.9	0.9	0.9	12	12	1.8	1.8	300	300	355	355
10-18	27.8-75	28-75	600	600	1.2	1.1	1.3	1	16	16	2.4	2.4	400	400	40	40
19-65+	45-75	40-75	600	600	1.2	1.1	1.3	1	16	14	2.4	2.4	400	400	45	45
Pregnancy			800		1.4		1.4		18				600		55	
Lactation			850		1.5		1.6		17				500		70	

^b arbitrary values, Niacin-NEs, niacin equivalents.

DFE- Dietary folate equivalent

Requirements of macrominerals for different age groups of males and females

Age (yr)	Body weight (kg)		Ca mg/day (FAO-2004)		Phosphorus mg/day (FAO-2002)		Iron(FAO-2004) Recommended nutrient intake (mg/day) for a dietary iron bioavailability						Na mg/day (RI), NIN 2010		K mg/day (RI), NIN 2010		Mg(mg/day) FAO-2004					
	Male	Female	Male	Female	Male	Female	15%	32%	30%	5%	15%	12%	10%	5%	Male	Female	Male	Female				
	11-43- 15-67- 17-69- 18-46- 20-37- 25	6-91- 10-79- 13-06- 16-81- 17-81- 19-76- 24-82	300-400g 500 600 700 1300	300-400g 500 600 700 1300	90-275 460 500 500 1250	90-275 460 500 500 1250	6.2	7.7	9.3	18.6	6.2	7.71	9.3	18.6	407	589	628	1100	1550	260-54h 60	260-54h 60	
1-3	11-43- 15-67- 17-69- 18-46- 20-37- 25	6-91- 10-79- 13-06- 16-81- 17-81- 19-76- 24-82	300-400g 500 600 700 1300	300-400g 500 600 700 1300	90-275 460 500 500 1250	90-275 460 500 500 1250	6.2	7.7	9.3	18.6	6.2	7.71	9.3	18.6	407	589	628	1100	1550	260-54h 60	260-54h 60	
4-6	11-43- 15-67- 17-69- 18-46- 20-37- 25	6-91- 10-79- 13-06- 16-81- 17-81- 19-76- 24-82	300-400g 500 600 700 1300	300-400g 500 600 700 1300	90-275 460 500 500 1250	90-275 460 500 500 1250	6.2	7.7	9.3	18.6	6.2	7.71	9.3	18.6	407	589	628	1100	1550	260-54h 60	260-54h 60	
7-9	11-43- 15-67- 17-69- 18-46- 20-37- 25	6-91- 10-79- 13-06- 16-81- 17-81- 19-76- 24-82	300-400g 500 600 700 1300	300-400g 500 600 700 1300	90-275 460 500 500 1250	90-275 460 500 500 1250	6.2	7.7	9.3	18.6	6.2	7.71	9.3	18.6	407	589	628	1100	1550	260-54h 60	260-54h 60	
10	11-43- 15-67- 17-69- 18-46- 20-37- 25	6-91- 10-79- 13-06- 16-81- 17-81- 19-76- 24-82	300-400g 500 600 700 1300	300-400g 500 600 700 1300	90-275 460 500 500 1250	90-275 460 500 500 1250	6.2	7.7	9.3	18.6	6.2	7.71	9.3	18.6	407	589	628	1100	1550	260-54h 60	260-54h 60	
11-14 Pre-weanling	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
11-14	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
15-17	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
18	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
19-50	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
51-65	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
65+	30-88- 43-96- 49-87- 58-64- 45-75- 45-75- 45-75- 45-75- 45-75- 45-75-	33-36- 43-22- 44-99- 48-51- 40-75- 40-75- 40-75- 40-75- 40-75- 40-75-	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1300 1300 1300 1300 1000 1000 1300 1300 1300 1300	1250 1250 1250 1250 700 700 700 700 700 700	1250 1250 1250 1250 700 700 700 700 700 700	9.7	12.2	14.6	29.2	21.8	27.7	32.7	65.4								
Pregnancy Lactation					700	700	7.5	9.4	11.3	22.6	10.0	12.5	15.0	30.0								

d Breastfed, h Formula-fed, g Cow milk fed

Requirements of microminerals for different age groups of males and females

Age (yrs)	Body weight (kg)		Iodine µg/day (FAO-2004)		Zinc mg/day (FAO-2004)					
	Male	Female	Male	Female	High bioavailability	Moderate bioavailability	Low bioavailability	High bioavailability	Moderate bioavailability	Low bioavailability
					Female					
<1	7.47	6.9	90	90	1.1d-2.5	2.8-4.1	6.6-8.4	1.1d-2.5	2.8-4.1	6.6-8.4
1-3	11.4-15.7	11-15	90	90	2.4	4.1	8.3	2.4	4.1	8.3
4-6	17.7-18.5	17-18	90	90	2.9	4.8	9.6	2.9	4.8	9.6
7-9	20.4-25	20-25	120	120	3.3	5.6	11.2	3.3	5.6	11.2
10-12	27.8-34.9	28-37	120	120	5.1	8.6	17.1	4.3	7.2	14.4
13-18	38.6-75	41-75	150	150	5.1	8.6	17.1	4.3	7.2	14.4
19-65+	45-75	40-75	150	150	4.2	7	14	3	4.9	9.8
Pregnancy (1 st trimester)				200				3.4	5.5	11
Pregnancy (2 nd trimester)				200				4.2	7.0	14
Pregnancy (3 rd trimester)				200				6.0	10	20
Lactation (0-6month)				200				5.8-5.3	9.5-8.8	19-17.5
Lactation (7-12month)				200				4.3	7.2	14.4

d Breastfed

Selected glossary

- **Cholesterol:** Cholesterol is a component of cell membranes and used to produce hormones and bile acids. Cholesterol is present only in animal sources of food (meat, sausages, bacon, eggs, whole milk, cheese, butter, liver etc.). The human body can produce sufficient cholesterol to meet biological requirements. Excess cholesterol gets deposited inside blood vessels leading to atherosclerosis.
- **Curd:** The part of milk that coagulates when the milk sours or is treated with acid or enzymes. Curd is defined as a product obtained by souring boiled or pasteurized milk naturally, by harmless lactic acid bacteria or other bacterial cultures. It may contain a wide variety of lactic acid bacteria, which are not defined qualitatively/quantitatively. In curd and buttermilk, most of the lactose is converted to lactic acid/acetic acid by the enzymes that are found in fermenting bacteria. Hence these products are easier to digest.
- **Dietary diversity score (DDS):** DDS is an indicator that measures access to household food variety. It also reflects in part the nutrient/micronutrient adequacy of the diets of household members. For household DDS (HDDS) FANTA/FAO classified foods into 12 groups (cereals, white tubers and roots, vegetables, fruits, meat, eggs, fish and sea foods, legumes and seeds, milk and milk products, oils and fats, sweets and spices.) Consumption of each food group/day (30g for solid and single ingredient and 60g for liquid and mixed dishes) counts one score. HDDS less than 5 is considered as poor, 6-8 as moderate and ≥ 9 as good.
- **Dietary fiber:** Dietary fiber is the non-digestible portion of fruits, vegetables and grains. There are two forms of fiber: soluble and insoluble. Soluble fiber contains pectin, gums

and mucilage which can be found in fruits, beans, fruits, and oats. Soluble fiber dissolves in water, reduces LDL and is good for bowel function. Insoluble fiber includes cellulose, hemicellulose and lignin which can be found in whole grains and vegetables. Insoluble fiber does not dissolve in water and helps to decrease cholesterol.

- **Fish oil:** These include omega 3 and omega 6 fatty acid. Fish oils play a crucial role in the prevention of atherosclerosis, heart attack, depression and cancer.

- **Obesity:** Obesity is an abnormal accumulation of body fat. Women with over 30% body fat and men with over 25% body fat are considered obese. Gynoid (female) obesity is known as lower obesity and pear- shape obesity. Android (male) obesity is known as abdominal, central, upper and apple- shape obesity and is associated with a greater risk of NCD than gynoid obesity. BMI is one of the indicators used in the assessment of obesity; BMI over 30 is considered as obesity.

- **Parboiled rice:** Rice that has been partially steamed before dehulling.

- **Saturated fat:** Saturated fatty acids have no double bonds between the individual carbon atoms of the fatty acid chain. Most fats derived from animal sources (meat and meat products, milk and milk products) are saturated fats. Hidden saturated fats are found in cakes, biscuits, pastries, other bakery products, fried foods and chocolates. Eating foods high in saturated fats can lead to elevated cholesterol levels in the blood and increase the risk of atherosclerosis including heart disease.

- **Skim milk:** Milk from which the cream has been removed. Sometimes, only half cream is removed, resulting in semi skimmed milk. Skimmed milk contains 0-0.5% of fat. Skim milk is recommended for people who are trying to lose weight or maintain a healthy weight.

- **Trans-fat:** It is a kind of unsaturated fat where carbon atoms around the double bond contain hydrogen atoms in trans position. Although trans-fats are unsaturated fat, they are considered harmful like saturated fat as they contribute to increasing LDL-cholesterol in humans and ultimately increase the risk of heart disease. The American Heart Association advises limiting trans-fat consumption to less than 1% of total energy. Trans fatty acids do not occur naturally in plant foods but occur in small amounts in animal foods. Trans fatty acids are formed during the hydrogenation of vegetable oils as in the manufacture of margarine. Cookies, cakes and most deep-fried foods also contain trans fatty acids.

- **Unsaturated fat:** Lipids containing fatty acids with double bonds are known as unsaturated fat and if there are multiple double bonds then they are called poly unsaturated fatty acids or PUFA, which are good for health through decreasing the risk of heart disease and maintaining the blood pressure in normal physiological condition. Linoleic, linolenic and arachidonic acids are the predominant poly unsaturated fatty acids. Linolenic acid is also known as omega-3 fatty acid and linoleic acid as omega-6 fatty acid. Plants and fish oils are the major sources of omega-3 and omega-6 fatty acids.

- **Waist circumference:** An indicator for the assessment of central obesity. A value of over 90 cm for males and over 80 cm for females is associated with NCD.

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Prof. Khalilur Rahman, Dept of Biochemistry & Molecular Biology, University of Dhaka

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Prof. Yearul Kabir, Dept of Biochemistry & Molecular Biology, University of Dhaka

Prof. Moududur Rahman, INFS, University of Dhaka

Prof. Sheikh Nazrul Islam, INFS, University of Dhaka

Prof. Nazma Shaheen, INFS, University of Dhaka

Mr. M A Wahed, Consultant, Health, Nutrition and Management, Dhaka

Prof. Md Nazrul Islam Khan, INFS, University of Dhaka

Prof. Abu Torab Abdur Rahim, INFS, University of Dhaka

Mr. Mostafa Faruq Al Banna, Associate Research Director, FPMU, Ministry of Food

Dr. Monirul Islam, Director, Nutrition, BARC, Ministry of Agriculture

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**Bangladesh Institute of Research
and Rehabilitation In Diabetes, Endocrine
and Metabolic Disorders (BIRDEM)
122, Kazi Nazrul Islam Avenue, Shahbag, Dhaka-1000**