UNIT 3 NUTRITION FOR INFANT, CHILD, ADOLESCENT AND ELDERLY

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3.0 INTRODUCTION

In Unit 2 you have learnt about importance of nutrition during pregnancy and lactation.

Good nutrition is the key to well-being of humans and lays the base for healthy life. It is a fundamental to achieving positive health, functional efficiency and productivity. The nutritional needs of the human body change across the lifecycle. For any given individual, the requirement of nutrients is dependent on his/her age, physiological status, physical activity, Basal Metabolic Rate (BMR) etc. Nutritional status is internationally recognised as an indicator of national development. Malnutrition, which encompasses both under-nutrition as well as over-nutrition, is recognised as an important public health problem and is one of the toughest challenges that the global community is facing today.

In this unit we shall discusses the nutritional requirements across the lifecycle and how to meet that changed requirement through balanced diet.
3.1 OBJECTIVES

After completing this unit, you shall be able to:

- know the Infant and Young Child Feeding (IYCF) guidelines;
- explain the nutritional needs of children, adolescents and elderly; and
- describe important National Nutritional Programmes.

3.2 SIGNIFICANCE OF NUTRITION ACROSS LIFE CYCLE

- Globally 45% of all child deaths are attributed to underweight.
- The magnitude of child under-nutrition in India is one of the highest in the world. Around 39 per cent of under 5 children in India are stunted, 15 per cent are wasted and 29 per cent are underweight with every sixth child in India being severely stunted, one in 20 being severely wasted and one in ten child being severely underweight.
- About 55% men and 75% non pregnant non lactating women are anaemic.
- Under nutrition during foetal and early childhood is known to be associated with chronic diseases in later life.
- Chronic diseases like coronary artery disease, hypertension, type 2 diabetes, some cancers are related to diet and nutritional status.
- Obesity is associated with higher risk of developing cancer breast, colon, endometrium, gallbladder, oesophagus, pancreas, etc.
- Consumption of foods rich in dietary fiber and antioxidants is associated with reduced risk of certain cancers.

3.3 INFANT AND YOUNG CHILD FEEDING GUIDELINES

Infant and Young Child Feeding (IYCF) is a set of well-known and common recommendations for appropriate feeding of new-born and children under two years of age. IYCF includes the following care practices.

Early Initiation of Breastfeeding means breastfeeding all normal newborns (including those born by caesarean section) as early as possible after birth, ideally within first hour. Colostrum, the milk secreted in the first 2–3 days, must not be discarded but should be fed to newborn as it contains high concentration of protective immunoglobulin’s and cells. No pre-lacteal fluid should be given to the newborn.

Colostrum contains large quantities of protective substances and growth factors and has more protein and Vitamins A and K than mature milk. It enhances the development and maturation of the baby’s gastro-intestinal tract. The anti-infective proteins and white cells provide the first immunisation against the diseases that a baby encounters after delivery. Although colostrum is secreted in small quantities (30–90 ml), it is sufficient to meet the caloric needs of a normal newborn in the first few days of life. Colostrum also has a mild purgative effect, which helps to
clear baby’s gut of meconium (the first, very dark stools) and helps to prevent jaundice by clearing the bilirubin from the gut. It stimulates the baby’s immature intestine to develop in order to digest and absorb milk and to prevent the absorption of undigested protein.

Exclusive breastfeeding for the first 6 months means that an infant receives only breast milk from his or her mother or a wet nurse, or expressed breast milk, and no other liquids or solids, not even water. The only exceptions include administration of oral rehydration solution, oral vaccines, vitamins, minerals supplements or medicines.

Following are the advantages of breastfeeding, breast milk is:

- the best natural food for babies.
- always clean.
- protects the baby from diseases.
- makes the child more intelligent.
- available 24 hours a day and requires no special preparation.
- nature’s gift to the infant and does not need to be purchased.
- Breastfeeding makes a special relationship between mother and baby, helps parents to space their children, and helps mother to shed extra-weight gained during pregnancy.

**Fig. 3.1: Benefits of Breastfeeding**

Complementary feeding means complementing solid/semi-solid food with breast milk after child attains age of six months. After the age of 6 months, breast milk is no longer sufficient to meet the nutritional requirements of infants. However infants are vulnerable during the transition, from exclusive breast milk to the introduction of complementary feeding, over and above the breast milk. For
ensuring that the nutritional needs of a young child are met breastfeeding must continue along with appropriate complementary feeding. The term “complementary feeding” and not “weaning” should be used. The complementary feeding must be:

- **Timely** - meaning that they are introduced when the need for energy and nutrients exceeds what can be provided through exclusive breastfeeding.

- **Adequate** - meaning that they provide sufficient energy, protein and micronutrients to meet a growing child’s nutritional needs.

- **Safe** - meaning the food is hygienically prepared, stored and fed with clean hands using clean utensils instead of bottles and/or teats.

- **Active feeding** - styles for complementary feeding are also important. Appropriate feeding styles can provide significant learning opportunities through responsive caregiver interaction, enhancing brain development in the most crucial first three years.

### Benefits of Optimal Complementary Feeding (timely adequate, appropriate and safe)

- Less likely to die
- Less diarrhoea and respiratory infections
- Improved cognitive development
- Better psychosocial development
- Optimal growth
- Prevention of stunting and acute malnutrition
- Prevention of over weight/obesity
- Less risk of anaemia
- Less risk of zinc and other micronutrient deficiencies

**Fig. 3.2: Benefits of Optimal Complementary Feeding**

### 3.3.1 First Food for the Baby

The staple cereal of the family should be used to make the first food for an infant. Porridge can be made with suji (semolina), broken wheat, atta (wheat flour) ground rice, ragi, millet etc, by using a little water or milk, if available. Roasted flour of any cereal can be mixed with boiled water, sugar and a little fat to make the first complementary food for the baby and could be started on the day the child becomes six months old. Adding sugar or jaggery and ghee or oil is important as it increases the energy value of the food. In the beginning the porridge could be made a little thinner but as the child grows older the consistency has to be thicker. A thick porridge is more nutritious than a thin one. In case a family cannot prepare the porridge for the infant separately, pieces of half chapati could be soaked in half a cup of milk or boiled water, mashed properly and fed to the baby after adding
Nutrition

sugar and fat. Soaked and mashed chapatti could be passed through a sieve so as to get a soft semi-solid food for the infant.

Fruits like banana, papaya, chikoo, mango etc could be given at this age in a mashed form. Infants could also be given reconstituted instant infant foods (preparation of which is discussed a little later) at this age.

3.3.2 Traditional Foods for Infants

Once the child is eating the cereal porridge well, mixed foods including cooked cereal, pulse and vegetable(s) could be given to the child. Most traditional foods given to infants in different parts of the country are examples of mixed foods like khichdi, dalia, sujikheer, upma, idli, dokhla, bhaat-bhaji etc. Sometimes traditional foods are given after a little modification so as to make the food more suitable for the child. For instance, mashed idli with a little oil and sugar is a good complementary food for the infant. Similarly bhaat can be made more nutritious by adding some cooked dal or vegetable to it. Khichdi can be made more nutritious by adding one or two vegetables in it while cooking.

3.3.3 Modified Family Food

In most families there is a cereal preparation in the form of roti or rice and a pulse or a vegetable preparation. For preparing a complementary food for the infant from the foods cooked for the family, a small amount of dal or vegetable preparation should be separated before adding spices to it. Pieces of chapati could be soaked in half a katori of dal and some vegetable, if available. The mixed food could be mashed well and fed to the baby after adding a little oil. If necessary the mixture could be passed through a sieve to get a semi-solid paste. Thus, rice or wheat preparation could be mixed with pulse and/or vegetable to make a nutritious complementary food for the infant. Modifying family’s food is one of the most effective ways of ensuring complementary feeding of infants.

3.3.4 Instant Infant Foods

Infant food mixes can be made at home from food grains available in the household. These mixes can be stored atleast for a month and enable frequent feeding of infants. These are satu like preparations which is quite familiar in the Indian community. One can take three parts of any cereal (rice/wheat) or millet (ragi, bajra, jowar), one part of any pulse (moong/channa/arhar) and half part of groundnuts or white til, if available. The food items should be roasted separately, ground, mixed properly and stored in airtight containers. For feeding, take two tablespoons of this infant food mix, add boiled hot water or milk, sugar or jaggery and oil/ghee and mix well. Cooked and mashed carrot, pumpkin or green leafy vegetables could be added to the porridge, if available. The infant can be fed with this food whenever freshly cooked food is not available in the family. The infant food mix could also be made into preparations like halwa, burfi, upma, dalia etc., and given to the child.

3.3.5 Protective Foods

Besides modified family food and reconstituted infant food mixes, protective foods like milk, curd, lassi, egg, fish and fruits and vegetables are also important to help in the healthy growth of the infants. Green leafy vegetables, carrots, pumpkin and seasonal fruits like papaya, mango, chikoo, banana etc., are
important to ensure good vitamin A and iron status of the child. Baby needs all foods from six months namely cereals, pulses, vegetables particularly green leafy vegetables, fruits, milk and milk products, egg, meat and fish if non-vegetarian, oil/ghee, sugar and iodised salt in addition to breastfeeding. A diversified diet of the infant along with breastfeeding will also improve the micronutrients’ status of the child.

### 3.3.6 Energy Density of Infant Foods

Low energy density of complementary foods given to young children and low frequency of feeding result in inadequate calorie intake and thus the malnutrition. Most of the foods are bulky and a child cannot eat more at a time. Hence, it is important to give small energy dense feeds at frequent intervals to the child with a view to ensure adequate energy intake by the child. Energy density of foods given to infants and young children can be increased in four different ways:

i) By adding a teaspoonful of oil or ghee in every feed. Fat is a concentrated source of energy and substantially increases energy content of food without increasing the bulk. The false belief in the community that a young child cannot digest fat has to be dispelled with by informing that a young infant digests fat present in breast milk and all other foods like cereals and pulses and that there is no reason to feel that a child can not digest visible fat when added to food.

ii) By adding sugar or jaggery to the child’s food. Children need more energy and hence adequate amounts of sugar or jaggery should be added to child’s food.

iii) By giving malted foods. Malting reduces viscosity of the foods and hence child can eat more at a time. Malting is germinating whole grain cereal or pulse, drying it after germination and grinding. Infant Food Mixes prepared after malting the cereal or pulse will provide more energy to the child. Flours of malted foods when mixed with other foods help in reducing the viscosity of that food. Amylase Rich Flour (ARF) is the scientific name given to flours of malted foods and must be utilised in infant foods.

iv) By feeding thick mixtures. Thin gruels do not provide enough energy. A young infant particularly during 6–9 months requires thick but smooth mixtures as hard pieces in the semi-solid food may cause difficulty if swallowed. The semi-solid foods for young infants can be passed through a sieve by pressing with a ladle to ensure that the mixed food is smooth and uniform without any big pieces or lumps.

### 3.3.7 Frequency of Feeding

Infants and young children need to be fed 5–6 times a day in addition to breastfeeding. It must be remembered that inadequate feeding of infants and young children during the first two years is the main cause of malnutrition.

### 3.3.8 Continued Breastfeeding

Breastfeeding must be continued up to the age of two years or beyond. Continuing breastfeeding while giving adequate complementary foods to the baby provides all the benefits of breastfeeding to the baby. In other words, the child gets energy, high quality protein, vitamin A, anti-infective properties and other nutrients besides
achieving emotional satisfaction from the breastfeeding much needed for optimum development of the child. Breastfeeding especially at night ensures sustained lactation. In the beginning when the complementary foods are introduced after six months of age, the complementary food should be fed when the infant is hungry. As the child starts taking complementary foods well, the child should be given breastfeeding first and then the complementary food. This will ensure adequate lactation.

3.3.9 Active Feeding

Adopting caring attitude while feeding the baby like talking to the child, playing with the child stimulates appetite and development. One-two year old child should be given food on a separate plate and encouraged to eat on its own. Eating at the same time and at the same place also helps in improving appetite and avoids distractions.

<table>
<thead>
<tr>
<th>Optimal IYCF practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Early initiation of breastfeeding; immediately after birth, preferably within one hour.</td>
</tr>
<tr>
<td>b) Exclusive breastfeeding for the first six months of life i.e. 180 days (no other foods or fluids, not even water; but allows infant to receive ORS, drops, syrups of vitamins, minerals and medicines when required).</td>
</tr>
<tr>
<td>c) Timely introduction of complementary foods (solid, semisolid or soft foods) after the age of six months i.e. 180 days.</td>
</tr>
<tr>
<td>d) Continued breastfeeding for 2 years or beyond.</td>
</tr>
<tr>
<td>e) Age appropriate complementary feeding for children 6–23 months, while continuing breastfeeding. Children should receive food from 4 or more food groups mentioned below and fed for a minimum number of times (2 times for breastfed infants 6–8 months; 3 times for breastfed children 9–23 months; 4 times for non-breastfed children 6–23 months).</td>
</tr>
<tr>
<td>i) Grains, roots and tubers, legumes and nuts;</td>
</tr>
<tr>
<td>ii) Dairy products;</td>
</tr>
<tr>
<td>iii) Flesh foods (meat fish, poultry);</td>
</tr>
<tr>
<td>iv) Eggs,</td>
</tr>
<tr>
<td>v) Vitamin A rich fruits and vegetables;</td>
</tr>
<tr>
<td>vi) Other fruits and vegetables</td>
</tr>
<tr>
<td>f) Active feeding for children during and after illness.</td>
</tr>
</tbody>
</table>

Feeding during illness

- Never starve the child.
- Feed energy-rich cereals-pulse diet with milk and mashed vegetables.
- Feed small quantities at frequent intervals.
- Continue breastfeeding as long as possible.
- Give plenty of fluids during illness.
- Use oral rehydration solution to prevent and correct dehydration during diarrhea episodes.
3.4 NUTRITIONAL NEEDS OF CHILDREN AND ADOLESCENTS

Childhood and adolescence are periods of continuous growth and development. An infant grows rapidly, doubling its birth weight by 5 months and tripling it by 1 year of age. During the second year, the child increases not only in height by 7–8 cm but also gains 4 times of its birth weight. During the pre-adolescent period the child grows, on an average, 6–7 cm in height and 1.5 to 3 kg in weight every year and simultaneously development and maturation of various tissues and organs take place. Children require more food as compared to adults. This is because the children not only need food for maintaining the BMR, thermogenesis, repairing wear and tear, but also for the important function of continuous growth. Child therefore needs all kinds of extra nutrients, namely, proteins, fats carbohydrates, minerals and vitamins.

Adolescent period (teenage) is spread almost over decade. It is characterised by rapid increase in height and weight, hormonal changes, sexual maturation and wide swings in emotion. Adolescent growth spurt starts at about 10–12 years in girls and two years later in boys. The annual peak rates for height and weight are 9–10 cm and 8–10 kg. Development of critical bone mass is essential during this period as this forms the ground for maintaining mineral integrity of the bone in
Later life. The pattern and proportion of various body components like body water, muscle mass, bone and fat increase during the entire childhood and adolescence to reach adult values by about 18 years. Adolescent girls are at greater physiological stress than boys because of menstruation. Their nutritional needs are of particular importance as they have to prepare for motherhood. All these rapid anabolic changes require more nutrients per unit body weight.

Growing children and adolescents require more calcium. Though recommended dietary allowances for calcium are about 600–800 mg/day, it is desirable to give higher quantities of calcium for adolescents to achieve high peak bone mass. To achieve optimal peak bone mass, it is recommended to consume calcium rich foods like milk and milk products, fox tail millet (Ragi), til etc.

Older children and adolescents should consume plenty of milk to fulfill the high calcium requirements. Cooking oils/ghee (25–50 g) should be consumed. Over indulgence in fats may be avoided. Excessive salt intake should be avoided particularly by children having a family history of hypertension. Adolescence is the vulnerable stage for developing wrong food habits as well as bad habits like smoking, chewing tobacco or drinking alcohol. These should be avoided. In addition to consumption of a nutritious well balanced diet, appropriate lifestyle practices and involvement in physical activity such as games/sports should be encouraged among children and adolescents.

**Protein and Energy requirements**

Based on the FAO/WHO recommendations the energy and protein requirements are worked out for Indian children. These are given in Tables below 3.1 and 3.2.

**Table 3.1 : Daily Energy Requirements for Children and Adolescents**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Boys (kcal/kg)</th>
<th>Girls (kcal/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>1287</td>
<td>1193</td>
</tr>
<tr>
<td>4-6</td>
<td>1752</td>
<td>1630</td>
</tr>
<tr>
<td>7-9</td>
<td>2075</td>
<td>1833</td>
</tr>
<tr>
<td>10-12</td>
<td>2194</td>
<td>1965</td>
</tr>
<tr>
<td>13-15</td>
<td>2447</td>
<td>2056</td>
</tr>
<tr>
<td>16-18</td>
<td>2642</td>
<td>2064</td>
</tr>
</tbody>
</table>

**Table 3.2 : Daily Protein Requirements of Children**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Boys (g/kg body weight)</th>
<th>Girls (g/kg body weight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>1.81</td>
<td>1.81</td>
</tr>
<tr>
<td>2-3</td>
<td>1.67</td>
<td>1.67</td>
</tr>
<tr>
<td>3-4</td>
<td>1.61</td>
<td>1.61</td>
</tr>
<tr>
<td>4-6</td>
<td>1.52</td>
<td>1.52</td>
</tr>
<tr>
<td>7-9</td>
<td>1.48</td>
<td>1.48</td>
</tr>
<tr>
<td>10-12</td>
<td>1.46</td>
<td>1.45</td>
</tr>
<tr>
<td>13-15</td>
<td>1.4</td>
<td>1.33</td>
</tr>
<tr>
<td>16-18</td>
<td>1.31</td>
<td>1.21</td>
</tr>
</tbody>
</table>
Fat Requirements

The minimum visible fat intake would also be 5% of total energy. For their energy intake of 2400 kcal, minimum visible fat intake works out to 12 g/day, but the desirable intake levels should be 20 g/day, which helps to reduce the bulk of diet. Balanced diet for infants, children and adolescents is shown in Table 3.3.

Table 3.3: Balanced Diet for Infants, Children and Adolescents (Number of Portions)

<table>
<thead>
<tr>
<th>Food Groups</th>
<th>g/portion</th>
<th>Infants 6 - 12 Months</th>
<th>1 - 3 yr</th>
<th>4 - 6 yr</th>
<th>7 - 9 yr</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Infants 6 - 12 Months</td>
<td>1 - 3 yr</td>
<td>4 - 6 yr</td>
<td>7 - 9 yr</td>
<td>10 - 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 yr</td>
<td>2 yr</td>
<td>3 yr</td>
<td></td>
<td>Girls</td>
</tr>
<tr>
<td>Cereals &amp; millets</td>
<td>30</td>
<td>0.5</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Pulses</td>
<td>30</td>
<td>0.25</td>
<td>1</td>
<td>1.0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Milk (ml) &amp; milk products</td>
<td>100</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Roots &amp; tubers</td>
<td>100</td>
<td>0.5</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Green leafy vegetables</td>
<td>100</td>
<td>0.25</td>
<td>0.5</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Other vegetables</td>
<td>100</td>
<td>0.25</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Fruits</td>
<td>100</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sugar</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Fat/ oil (visible)</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Check Your Progress 2

1) True regarding dietary requirement during adolescence is
   a) Requirement is similar to adults
   b) Daily protein requirement is 1gm/kg/day
   c) Desirable fat intake of 20 gm/day
   d) Over indulgence in fats may be avoided

2) True regarding dietary requirement of children is
   a) Requirement is similar to adults
   b) Fatty foods should be avoided
   c) Daily protein requirement is 1gm/kg/day
   d) Calcium requirement is increased

3) True regarding adolescent girls is
   a) Requirement is similar to adolescent boys
   b) More physiological stress compared to boys
   c) Daily protein intake should be doubled
   d) Growth spurt is 12–14 years of age
3.5 NUTRITIONAL NEEDS OF PREGNANT AND LACTATING MOTHERS

We have discussed nutritional needs of pregnant and lactating mother in details in Unit 2. Let us read in brief over here as given below:

3.5.1 Nutrition of Pregnant Women

A pregnant woman needs:
- An adequate nutritious diet
- Adequate rest during last trimester
- Iron and Folic Acid tablets throughout the pregnancy
- Immunisation

Diet
- Increase food intake. A pregnant mother requires 300 extra calories per day to meet the demands of pregnancy.
- Whole gram, pulses and legumes, sprouted pulses, leafy vegetables, jaggery, dates, groundnuts are foods of plant origin having good iron content.
- Include green leafy vegetables in daily diet right from the beginning as all foliage provide “folic acid” much needed during early months.
- Consume one seasonal fruit daily.
- Milk, curd, butter milk, egg, meat, fish are helpful.
- Iodised salt should be consumed as pregnant women requires sufficient iodine for brain development of the child in the womb.
- Take plenty of fluids/water.
- Take small and frequent meals.

Rest
- Heavy work should be avoided throughout the pregnancy.
- Rest (in lying down position) during third trimester is important to enable adequate flow of nutrients from mother to the child.
- A woman should gain 10–12 kg weight during pregnancy.

Iron and Folic Acid tablets
- IFA tablets should be consumed throughout the pregnancy.
- Iron tablets may cause black stools which are harmless.
- Iron and folic acid tablets prevent anaemia and helps a women to deliver a normal healthy baby.
- The folic acid deficiency can cause “Neural tube defects” in the newborns.

Immunisation
Immunisation of the pregnant woman with tetanus toxoid (TT) given between the 5th and 8th months of pregnancy in two doses at an interval of 4 weeks is essential.
### 3.5.2 Nutrition of Lactating Mothers

A lactating mother requires to eat more than what she was eating during pregnancy. A lactating mother requires 550 calories extra per day to meet the needs of production of mother’s milk for the new born baby. A good nutritious diet prepared from low cost locally available foods, family support and care, and a pleasant atmosphere in the family helps improve lactation and ensures health of both the mother and the baby.

**Diet**
- Include more of cereal, pulse and green leafy vegetable in daily diet.
- Take vegetables and one seasonal fruit a day.
- Take milk, butter milk, fluids and a lot of water.
- Egg, meat, fish are beneficial.
- Energy dense foods like ghee/oil and sugar are necessary to meet the increased energy needs.

**Rest**
Breastfeed in a relaxed state. Any type of mental tension decreases milk secretion.

**IFA tablets**
Take iron and folic acid tablets for first six months of lactation.

<table>
<thead>
<tr>
<th>Check Your Progress 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) A pregnant mother requires _____ extra calories per day to meet the demands of pregnancy.</td>
</tr>
<tr>
<td>a) 300  b) 400  c) 450  d) 550</td>
</tr>
<tr>
<td>2) A lactating mother requires _____ extra calories per day to meet the needs of production of mother’s milk for the new born baby.</td>
</tr>
<tr>
<td>a) 350  b) 450  c) 550  d) 650</td>
</tr>
<tr>
<td>3) True about nutritional requirement of pregnant mother is</td>
</tr>
<tr>
<td>a) Only selected fruits are to be consumed</td>
</tr>
<tr>
<td>b) Consumption of Iodised salt is desirable</td>
</tr>
<tr>
<td>c) Consumption of curd should be limited</td>
</tr>
<tr>
<td>d) Extra fluids are not needed</td>
</tr>
<tr>
<td>4) True for lactating mothers is</td>
</tr>
<tr>
<td>a) Stress decreases milk secretion</td>
</tr>
<tr>
<td>b) Iron-folic acid tablets inhibit milk secretion</td>
</tr>
<tr>
<td>c) Nutritional requirement is same as in pregnancy</td>
</tr>
<tr>
<td>d) Ghee/oils should be avoided in diet</td>
</tr>
<tr>
<td>5) True regarding pregnancy is</td>
</tr>
<tr>
<td>e) Fatty foods should be avoided in diet</td>
</tr>
<tr>
<td>f) 10–12 kg weight gain should be there</td>
</tr>
<tr>
<td>g) IFA tablets to be taken in last trimester</td>
</tr>
<tr>
<td>h) Heavy work to be avoided in last trimester</td>
</tr>
</tbody>
</table>
3.6 NUTRITIONAL NEEDS FOR THE ELDERLY

Provision of adequate nutrition to elderly is complex. The physiological, social, economic, medical and psychological changes that take place in old age, determine food intake, digestion and nutritional status. The BMR reduces with age and so does the appetite and physical activity. These factors warrant the reduction of diet. The elderly often are lonely and socially excluded that hampers their adequate dietary intake. Chronic illnesses restrict food intake, for example salt has to be restricted in hypertension, sugar in diabetes, fat in cardio vascular disease (CVD) and proteins in renal disease. Owing to this, the ‘taste’ of food and zeal to cook and eat is lost. Certain psycho-social factors like loneliness, lack of family support, feeling of worthlessness, stresses of daily living and possible economic constraints further limit the intake.

Energy: Evidence regarding nutritional requirements of elderly is lacking and there are no concrete guidelines for the same. But as the BMR and physical activity go down in the elderly the energy requirement need to be curtailed. It is recommended that energy requirement to be reduced by 11% in elderly men and 10% in women, as compared to young adults.

Proteins: Lean body mass protein, turnover and protein synthesis fall with age. WHO expert group has recommended a protein intake of 1 to 1.25 g / kg per day.

Fats and Oils: Fats and oils are recommended at the same level as for the young. In case the person suffers from any chronic lifestyle disease e.g. CVD, hypertension, stroke, etc he might be advised to restrict fat.

Vitamins: It is felt that the vitamin requirement goes up in old age. However, no special requirement has been slated for them.

Calcium: Sufficient amount of Calcium is required for the integrity of bones and to prevent osteoporosis in elderly. A slightly higher amount of calcium is recommended, about 0.8–1g per day.

Iron: The elderly may have lower iron requirements than the young. However, there may be underlying disorders that interfere either with iron absorption or cause blood loss (peptic ulcer, haemorrhoids etc). Hence their iron requirement cannot be scaled down and it should be the same as for the young.

Diet for the Elderly: Except for a marginal reduction in energy requirement, the need for other nutrients almost remains the same. Besides the diet being nutritionally adequate the food preparations for the elderly should be tasty, soft and easily palatable. These basic principles are summarised in Box below.

<table>
<thead>
<tr>
<th>Principles of the Diet for Elderly</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Simple but nutritious food</td>
</tr>
<tr>
<td>• Include green leafy vegetables</td>
</tr>
<tr>
<td>• Eat plenty of fruits</td>
</tr>
</tbody>
</table>
• Include whole cereals
• Insist on frequent, small meals
• Drink plenty of fluids
• Avoid fasting
• Avoid fried foods
• Consume low salt and sugar
• Food should be easy to cook

The suggested typical balanced diet for elderly, along with the nutrients supplied with it is given in Table 3.4 below:

### Table 3.4 Balanced Diet for the Elderly

<table>
<thead>
<tr>
<th>Foodstuff</th>
<th>Raw Quantity (gms)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Cereals</td>
<td>350</td>
</tr>
<tr>
<td>Pulses</td>
<td>50</td>
</tr>
<tr>
<td>Vegetables</td>
<td>200</td>
</tr>
<tr>
<td>Green leafy vegetables</td>
<td>50</td>
</tr>
<tr>
<td>Fruits</td>
<td>200</td>
</tr>
<tr>
<td>Milk and milk products</td>
<td>300</td>
</tr>
<tr>
<td>Sugar</td>
<td>20</td>
</tr>
<tr>
<td>Fats and oil</td>
<td>25</td>
</tr>
</tbody>
</table>

Approximate nutrient contents of above food items

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>2200</td>
<td>1700</td>
</tr>
<tr>
<td>Protein</td>
<td>65 g</td>
<td>50 g</td>
</tr>
<tr>
<td>Fat</td>
<td>50 g</td>
<td>40 g</td>
</tr>
<tr>
<td>Calcium</td>
<td>1 g</td>
<td>0.9 g</td>
</tr>
<tr>
<td>Iron</td>
<td>38 mg</td>
<td>30 mg</td>
</tr>
<tr>
<td>Vitamin A(Retinol)</td>
<td>1030 μg+v</td>
<td>930 μg+v</td>
</tr>
</tbody>
</table>

### Check Your Progress 4

1) Which of the following is not true regarding diet for the elderly?
   a) Appetite goes down
   b) Dentition restricts food intake
   c) Food requirement is half of young adult
   d) Lack of evidence to predict RDA for elderly.

2) Which of the following is not a principle for diet of elderly?
   a) Restrict to 2 major meals a day
   b) Drink plenty of fluids
   c) Desirable to keep fasting
   d) Energy dense fried foods are desirable
3) Daily calcium requirement in elderly is ____ gms
   a) 1    b) 2    c) 3    d) 4

4) Daily protein requirement in elderly is ____ gms
   a) 1    b) 2    c) 3    d) 4

5) Daily iron requirement in elderly is __________ from adults
   a) Lower
   b) Same
   c) More
   d) Depends on age and sex

3.7 IMPORTANT NATIONAL NUTRITIONAL PROGRAMMES

You have read in Unit 1 about for National Nutrition programmes, let us go through the flagship programme of GOI as given below:

3.7.1 Integrated Child Development Services (ICDS) Scheme

Launched on 2nd October, 1975, the Integrated Child Development Services (ICDS) Scheme is one of the flagship programmes of the Government of India and represents one of the world’s largest and unique programmes for early childhood care and development. It is the foremost symbol of country’s commitment to its children and nursing mothers, as a response to the challenge of providing pre-school non-formal education on one hand and breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity and mortality on the other. The beneficiaries under the Scheme are children in the age group of 0–6 years, pregnant women and lactating mothers.

Objectives of the Scheme are to:
• improve nutritional and health status of children in age-group 0–6 years;
• lay foundation for proper psychological, physical and social development of the child;
• reduce incidence of mortality, morbidity, malnutrition and school dropout;
• achieve effective co-ordination of policy and implementation amongst the various departments to promote child development; and
• enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

Services under ICDS

The ICDS Scheme offers a package of six services, viz.
• Supplementary Nutrition
• Pre-school non-formal education
• Nutrition and health education
• Immunisation
• Health check-up
• Growth monitoring and
• Referral services

The last three services are related to health and are provided by Ministry/Department of Health and Family Welfare through NRHM & Health system. The perception of providing a package of services is based primarily on the consideration that the overall impact will be much larger if the different services develop in an integrated manner as the efficacy of a particular service depends upon the support it receives from the related services. For better governance in the delivery of the Scheme, convergence is, therefore, one of the key features of the ICDS Scheme. This convergence is in-built in the Scheme which provides a platform in the form of Anganwadi Centres for providing all services under the Scheme.

The delivery of services to the beneficiaries is as follows:

<table>
<thead>
<tr>
<th>Services</th>
<th>Target Group</th>
<th>Service Provided by</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Supplementary Nutrition</td>
<td>Children below 6 years, Pregnant &amp; Lactating Mothers (P&amp;LM)</td>
<td>Anganwadi Worker and Anganwadi Helper [MWCD]</td>
</tr>
<tr>
<td>ii) Immunisation*</td>
<td>Children below 6 years, Pregnant &amp; Lactating Mothers (P&amp;LM)</td>
<td>ANM/MO [Health system, MHFW]</td>
</tr>
<tr>
<td>iii) Health Check-up*</td>
<td>Children below 6 years, Pregnant &amp; Lactating Mothers (P&amp;LM)</td>
<td>ANM/MO/AWW [Health system, MHFW]</td>
</tr>
<tr>
<td>iv) Referral Services</td>
<td>Children below 6 years, Pregnant &amp; Lactating Mothers (P&amp;LM)</td>
<td>AWW/ANM/MO [Health system, MHFW]</td>
</tr>
<tr>
<td>v) Pre-School Education</td>
<td>Children 3-6 years</td>
<td>AWW [MWCD]</td>
</tr>
<tr>
<td>vi) Nutrition &amp; Health Education</td>
<td>Women (15-45 years)</td>
<td>AWW/ANM/MO [Health system, MHFW &amp; MWCD]</td>
</tr>
</tbody>
</table>

* AWW assists ANM in identifying the target group

**Nutrition and feeding norms for Supplementary Nutrition under ICDS**

Provision of supplementary nutrition under the ICDS Scheme is primarily made to bridge the gap between the Recommended Dietary Allowance (RDA) and the Average Daily Intake (ADI) of children and pregnant and lactating women. State Governments/UTs are supposed to provide 300 days of supplementary food to the beneficiaries in a year which would entail giving more than one meal to the children from 3–6 years who visit AWCs. This includes morning snacks in the form of milk/banana/egg/seasonal fruits/micro-nutrient fortified food followed by a hot cooked meal (HCM). For children below 3 years of age, pregnant and lactating mothers, Take Home Rations (THRs) in the form of pre-mixes/ready-to-eat food are provided. Besides, for severely underweight children in the age group of 6 months to 6 years, additional food items in the form of micronutrient fortified food and/or energy dense food as THR is
Nutrition provided. The extent of nutritional supplements to different types of beneficiaries is indicated below:

**Nutritional Norms in ICDS (since February, 2009)**

<table>
<thead>
<tr>
<th>Beneficiaries</th>
<th>Calories</th>
<th>Protein (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (6 months to 72 months)</td>
<td>500</td>
<td>12-15</td>
</tr>
<tr>
<td>Severely Malnourished Children (SAM) (6 months-72 months)</td>
<td>800</td>
<td>20-25</td>
</tr>
<tr>
<td>Pregnant women and lactating mothers</td>
<td>600</td>
<td>18-20</td>
</tr>
</tbody>
</table>

### 3.7.2 National Programme of Mid Day Meal in Schools (MDMS)

MDMS is a flagship programme of the Government of India aiming at enhancing enrollment, retention and attendance and simultaneously improving nutritional levels among children studying in Government, Local Body and Government-aided primary and upper primary schools and the Centres run under Education Guarantee Scheme (EGS)/Alternative & Innovative Education (AIE) and National Children Labour Project (NCLP) schools of all areas across the country. Mid Day Meal (MDM) is also served in drought-affected areas during summer vacation also.

The primary aim of the programme is to provide at least one nourishing meal to the school-going children per day. The objectives are to:

i) served as an incentive for the children to attend school.

ii) reduce dropouts from school.

iii) improve the nutritional status of the child.

There are certain additional advantages of the programme too. It also serves as an opportunity to impart basic health/nutritional education to children. Moreover, some local women get employment to cook food for the midday meal.

It must be remembered that the programme provides a supplement, and not a substitute to the food eaten at home. This meal provides one-third the total daily energy requirement and half the need of proteins. The central government (Ministry of Education) supplies the full quota of grains to the states. Food that could be cooked easily, available locally and at low cost is preferable. To avoid monotony it is desirable to change the menu frequently.

To achieve the objectives of the Scheme, the guidelines prescribe the following nutritional content in the midday meal:

<table>
<thead>
<tr>
<th>Components</th>
<th>Primary</th>
<th>Upper Primary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>450 Cal</td>
<td>700 Cal</td>
</tr>
<tr>
<td>Protein</td>
<td>12 gms.</td>
<td>20 gms.</td>
</tr>
<tr>
<td>Micronutrients</td>
<td>Adequate quantities of micronutrients like Iron, Folic Acid, Vitamin A etc.</td>
<td></td>
</tr>
</tbody>
</table>

The component-wise break up of above nutrition value of food items constituting Mid Day Meal (MDM), both for primary and upper primary, are as under:
3.8 LET US SUM UP

In the unit we have discussed nutrition for infant, child, adolescent and elderly. Mid Day Meal Scheme envisages supply of adequate quantities of micro nutrient such as iron, folic acid, zinc and the semicro nutrients are to be supplemented through convergence with the school health and other programmes of the National Rural Health Mission (NRHM) of the Ministry of Health and Family Welfare, for this, no budgetary support is provided under the Mid Day meal scheme. These appropriate supplementations are provided depending on common deficiencies found only in the local area as to the target beneficiary group. National nutrition programme with focus on ICDS + MDMS related to child and adolescent are also been covered.

**Check Your Progress 5**

1) Mid day meal programme offers:
   a) Half of daily protein and one third of calorie requirement
   b) Half of daily protein and half of calorie requirement
   c) One third daily protein and one third of calorie requirement
   d) One third of daily protein and one third of calorie requirement.

2) To a child under 6 years of age, ICDS provides :
   a) 500 kcal energy and 12-15 g protein
   b) 800 kcal energy and 12-15 g protein
   c) 500 kcal energy and 20-25 g protein
   d) 800 kcal energy and 20-25 g protein
3) Which of the following services under ICDS are not provided by the Anganwadi worker herself
   a) Supplementary nutrition
   b) Non-formal pre-school education
   c) Immunisation
   d) Nutrition and Health Education.

4) To a severely malnourished child, ICDS provides :
   a) 500 kcal energy and 12-15 g protein.
   b) 800 kcal energy and 12-15 g protein
   c) 500 kcal energy and 20-25 g protein
   d) 800 kcal energy and 20-25 g protein

5) To pregnant and lactating mothers, ICDS provides :
   a) 500 kcal energy and 20-25 g protein.
   b) 500 kcal energy and 18-20 g protein
   c) 600 kcal energy and 18-20 g protein
   d) 600 kcal energy and 20-25 g protein

3.9 MODEL ANSWERS

Check Your Progress 1
1-a, 2-c, 3-c, 4-b, 5-a,b,d,e

Check Your Progress 2
1-d, 2-d, 3-b

Check Your Progress 3
1-a, 2-c, 3-b, 4-a, 5-b

Check Your Progress 4
1-c, 2-b, 3-a, 4-a, 5-a

Check Your Progress 5
1-a, 2-a, 3-c, 4-d, 5-c

3.10 REFERENCES


