

Block

3

NUTRITION OF THE MOTHER AND CHILD

UNIT 8

**Nutrition Through the Life Cycle – Pregnancy and
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BLOCK 3 NUTRITION OF THE MOTHER AND CHILD

Block 3 focuses on the requirement of food throughout our life from the time of conception till death. It emphasizes the importance of nutritional needs at different stages of life and also gives knowledge on how to nourish the body through a judicious combination of food.

In *Unit 8* we begin our study on "Nutrition through the life cycle", with the foetal stage during pregnancy. The nutritional needs and risk factors for malnutrition in pregnancy are explained to you to help you take care of both the mother and the baby to be, during pregnancy.

In *Unit 9* we continue our study on "Nutrition through the life cycle" focusing on infancy. We will discuss the importance of breastfeeding, complementary feeding and hygienic practices in feeding.

In *Unit 10* we further continue our learning on "Nutrition through the lifecycle" focusing on the preschool age. These stages of life are described as very critical stage of growth and also as vulnerable to infection and disease.

Our concern is to promote good food habits and good nutrition from the foundation stage of life so that the health and efficiency are ensured for the future adults.

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UNIT 8 NUTRITION THROUGH THE LIFE CYCLE -PREGNANCY AND FOETAL GROWTH

As you know, pregnancy is a period of dynamic change for a mother requiring a lot of care. A healthy mother can give birth to a healthy child. Keeping this aspect in mind we will learn about the importance of nutrition during this period.

Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Foetal Growth and Weight Gain during Pregnancy
 - 8.2.1 Eating Pattern and Weight Gain
- 8.3 Importance of Nutrition during Pregnancy
 - 8.3.1 Nutrition Needs during Pregnancy
- 8.4 Do's and Don'ts for Pregnant Mothers
- 8.5 Problems Encountered in Pregnancy
 - 8.5.1 Nausea and Vomiting
 - 8.5.2 Constipation
 - 8.5.3 Toxaemia
- 8.6 Risk Factors for Malnutrition in Pregnancy
- 8.7 Let Us Sum Up
- 8.8 Glossary
- 8.9 Answers to Check Your Progress Exercises

8.0 OBJECTIVES

After studying this unit, you will be able to:

- describe the normal growth and development of a baby in the mother's womb;
- identify nutritional needs during pregnancy and how you can meet them; and
- describe the care that should be taken during pregnancy to ensure a safe pregnancy and a safe delivery of a healthy baby.

8.1 INTRODUCTION

Pregnancy is a happy state for most women. Every mother would like her pregnancy to be one with no problems. A normal pregnancy, as you know,

lasts for 9 months or 270 days, approximately. During this time, the baby grows from the size of a tiny pinhead to a weight of almost 2.5 to 3 kg. No wonder the Chinese say that the child is one year old on the day it is born to emphasise all the growth and development that has taken place during the nine months in the mother's womb.

During the period of foetal growth in the mother's womb, the foetus is nourished directly by the mother herself, through a spongy structure called the placenta. Since the baby relies totally upon its mother for nourishment, you realise how vital it is to provide a pregnant woman with an adequate well balanced diet.

In this unit we shall trace the growth and development of the foetus, state the nutritional needs of the pregnant mother and the care to be taken for normal pregnancy and delivery.

8.2 FOETAL GROWTH AND WEIGHT GAIN DURING PREGNANCY

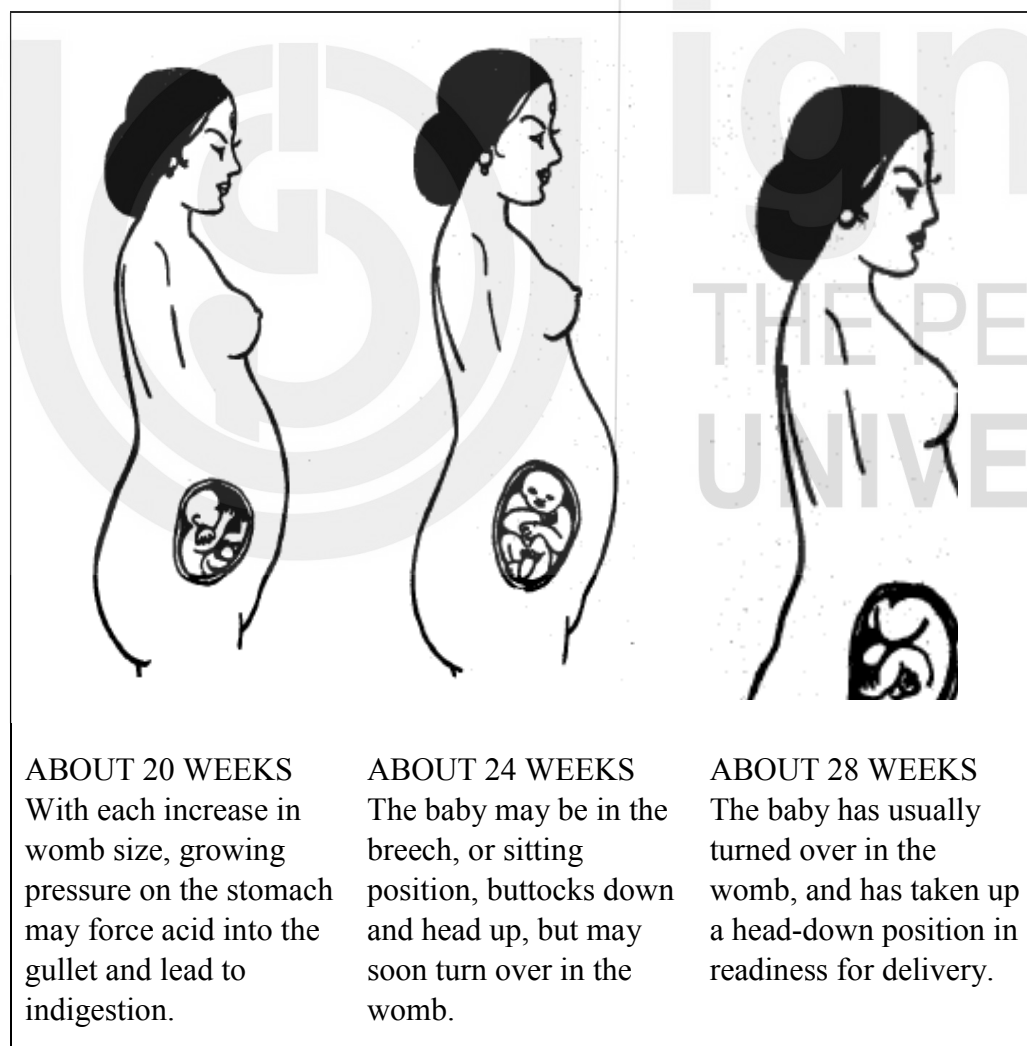
After the egg is fertilised it implants itself in the womb (uterine wall) and begin developing. In the first two weeks after implantation, the egg divides into many cells which sort themselves into three layers. This period is critical because any adverse influence at this time, will cause failure of the egg to survive, possibly even before the woman knows she is pregnant. In the next five weeks astonishing changes occur. In these weeks we call the developing baby "Embryo".

- The nervous system and the skin of the baby develop from the outermost layer of cells,
- The muscles and internal organ systems develop from the middle layer, and
- The glands, lining of the digestive, respiratory and excretory systems develop from the innermost layer.

Believe it or not, at eight weeks, the embryo is only 3 cms long; but it already has a central nervous system, a beating heart and fully formed digestive system. In the following seven months of pregnancy which we call the foetal period, a tremendous increase in the size of the baby takes place. Each and every organ and system will mature. Obviously, as the baby foetus develops and grows, its weight will increase as well. Look at Figure 8.1. It shows you the growth of the baby during these months. As you can see, the mother's body also undergoes simultaneous changes. To support the growing baby, the woman's womb expands, her breasts change and grow so that she can feed her baby when it is born. Her blood volume increases (almost doubles) so that she can nourish the growing baby. All this means that the mother must gain weight during pregnancy. You may wonder how much weight gain is normal. You know that each individual is different. Experts suggest that you can expect a total gain of 10 to 12 kg during pregnancy. If a woman is of small build and not very active, advise her to avoid gaining excessive weight. Look at Table 8.1 and see where and how much of all this increased weight is distributed in the mother's body.

Table 8.1: Distribution of the weight gained during pregnancy

Development	Total Weight Gained (kg)
Infant (baby) at birth	3.5
Mother's fat stores	0.9
baby and placenta	1.8
Increase in mother's blood volume to nourish baby	1.8
Increase in size of mother's breasts	0.405
Fluid to surround baby and cushion it	0.8
Placenta	0.65
Weight gained but not accounted for	1.64
Total weight gained	10.985



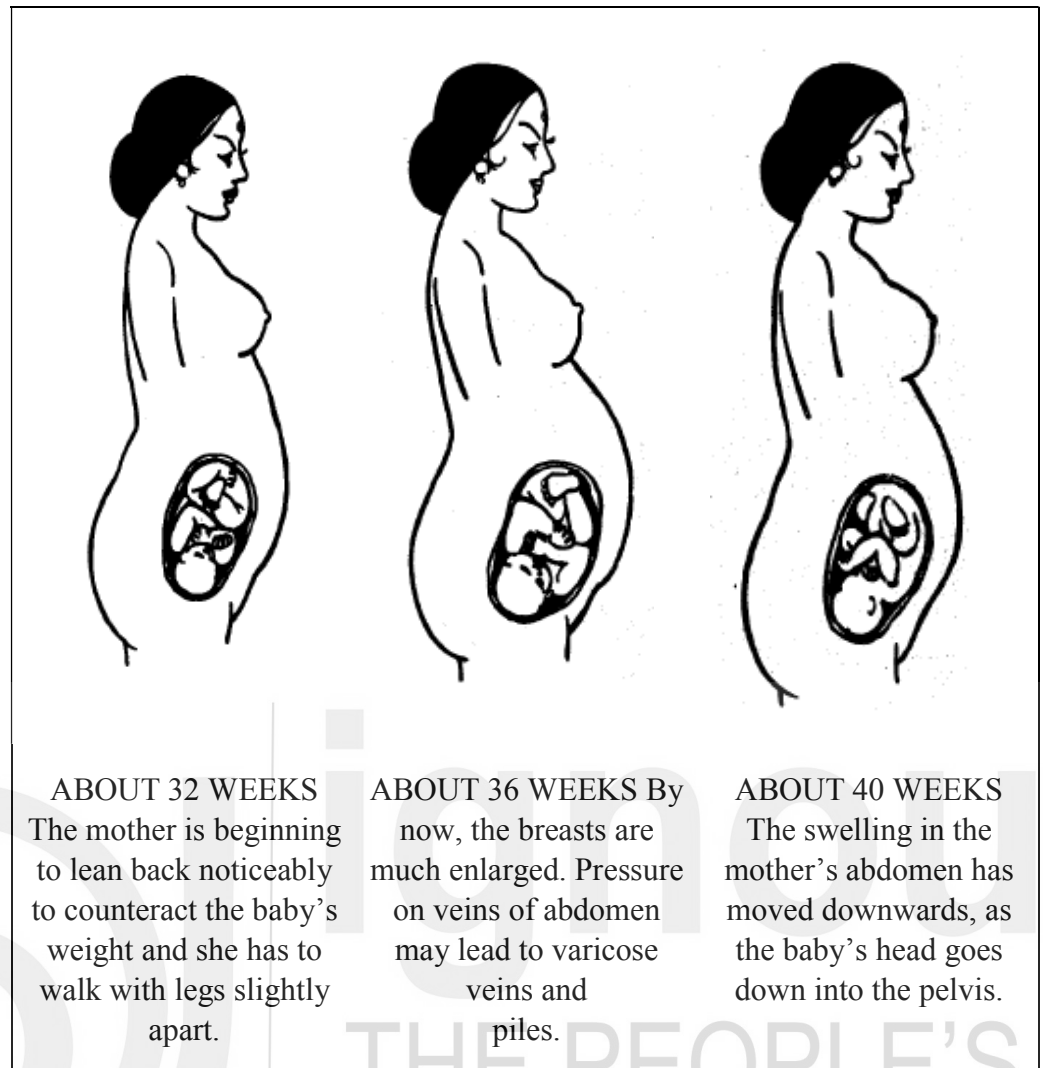


Figure 8.1 :Growth changes of a baby in the woman's body from the 5th to9th month of pregnancy

You may wonder what the fat stores are for, in the mother's body. Her body will use up these fat stores to produce milk for the baby after it is born. Therefore you must realise the importance of a mother putting on sufficient weight during pregnancy.

8.2.1 Eating Pattern and Weight Gain

You already know that a pregnant woman must gain about 10-12 kg during the entire pregnancy. Ideally a mother should begin her pregnancy as an adult at the appropriate weight for her height. It is advisable that during the first three months, a pregnant woman should put on approximately 1 to 2 kg. Thereafter, her weight gain should be at the rate of about 2 kg per month.

If a woman has gained more than the expected amount of weight early in pregnancy, advise her not to put on too much weight. However, she should not drastically curtail her diet. You may wonder why weight gain is so important during pregnancy. What would happen if a mother does not gain the full amount of weight recommended? She may give birth to an underweight baby. This may not be a serious problem if the baby is small, alert and healthy. However, a low birth weight baby is usually also

malnourished and weak. Such a baby may not be strong enough to get all the nourishment it needs by suckling. It may not be able to cry loudly and vigorously to attract its mother's attention.

During pregnancy, some women may develop a craving for certain foods. As long as these cravings do not interfere with good eating habits and do not pose any health hazards, you need not worry about it. Some women crave for amla, raw tamarind, etc. These foods are nutritious (good sources of vitamin C) and should be eaten.

Some women have nausea (feel sick) or morning sickness in early pregnancy. You will find that eating snack often helps to prevent and overcome the nausea.

8.3 IMPORTANCE OF NUTRITION DURING PREGNANCY

An adequate diet is very important so that the placenta grows well in order that the baby will receive all the nourishment it needs. If a pregnant woman does not consume sufficient food early in pregnancy, growth of the placenta and therefore the baby's growth may be less than normal.

A weak baby girl, when she becomes an adult (presuming that she is well-nourished throughout her childhood) grows to be smaller in stature and so may in turn bear an undersized or poorly developed infant. Such an infant will not be able to achieve its full potential. Thus the food that a woman eats, her nutritional status and her age affect the health of her children and the future of her family.

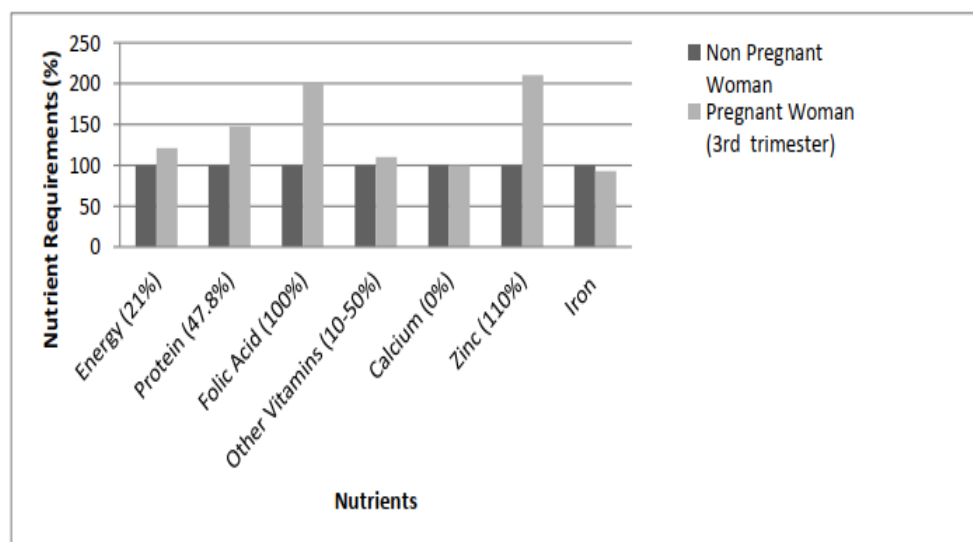
8.3.1 Nutrient Needs During Pregnancy

From Unit 5 on growth, you have read that nutritional needs are high during periods of intensive growth. Figure 8.2 shows you the additional amount of nutrients per cent needed by a pregnant woman beyond her basic pre-pregnancy needs. In the figure you will see that her basic needs (when she is not pregnant) are set at 100 per cent. Table 8.2 depicts the ICMR recommendations for energy and protein for pregnant woman.

Table 8.2: Recommendation of energy and protein for pregnant woman (ICMR, 2020)

Stage	Energy (Kcal)	Protein (gm)
2 nd Trimester	+350	+9.5
3 rd Trimester	+350	+22

* For weight gain of 10 kg in pregnant woman.



Source : Based on the dietary allowances for Indians by Indian Council of Medical Research (2020).

* Basic needs are set at 100 percent.

Figure 8.2 : Increase in nutritional requirements during pregnancy (Third trimester)

Energy: As you can see, during pregnancy a woman needs a greater amount of almost every nutrient. Although we have shown that the calorie requirement increases by 21%, you should be aware that those who have to do a lot of manual labour, would need even more energy. Another point to bear in mind is that if an adolescent girl (less than 18 years old) becomes pregnant, she needs more amount of nutrients because she herself is still growing.

In Table 8.2 Indian Council of Medical Research recommends that a pregnant woman's intake should be 350 Kcal more than her normal intake from the second half of pregnancy. This is because the baby grows very rapidly, as you know, in the second half of pregnancy. Extra calories (energy) can be obtained by increasing your intake of food by two chapatis, one katori dhal, and the oil used in their preparation.

Always ensure that a pregnant woman's weight increases gradually in the last six months of pregnancy. Encourage underweight mothers to gain more weight while those who are gaining excessive weight may be cautioned to restrict their weight gain during pregnancy.

Proteins : Proteins are needed for the growth of the foetus and maternal tissues. In Table 8.2 ICMR recommends, an additional intake of 22 gm of protein more than the normal intake during the second half of pregnancy (Total 78 g protein). Ensure that the protein is of good quality by combining cereals and pulses. Whenever possible, you can include milk/dahi, egg, meat or fish.

Minerals and Vitamins : Minerals and vitamins are necessary for growth, for formation of red blood cells, formation of bones and teeth and development of the nervous system. The need for minerals and vitamins is increased during pregnancy since energy and protein intake increases, the requirements for micronutrients needed for energy and protein utilisation i.e.

thiamine, riboflavin, magnesium, vitamin B₆ and zinc also increase. Folic acid and vitamin B₁₂ are important for production of new red blood cells. Iron is needed for synthesis of haemoglobin in both the maternal and foetal red blood cells. Thus the recommended intake of iron in pregnancy is 27 mg/day. For the foetal skeletal development calcium is drawn from the maternal blood supply. So intake of calcium should be 1000 mg/day. The maternal diet should consist enough of iodine for proper foetal development.

Thus it is important for you to see that the pregnant woman takes sufficient amount of foods which will provide her with the necessary minerals and vitamins. Do you know which foods will supply these?

Advise a pregnant woman to take sufficient cereals, pulses, green leafy vegetables, and fruits-like amla, guava, orange, papaya, mango. If she can afford it, ask her to include milk and milk products, eggs, meat or fish in her diet.

The mother's nutritional status is a crucial factor affecting pregnancy outcome. Her diet must be carefully planned to supply the nutrients needed to maintain her health, support the physiological change in her body and provide for the rapid growth and development of the unborn baby. We have given below a daily food guide to help you plan a diet for any pregnant woman among your family and friends (Table 8.3).

Table 8.3: Balanced diet for pregnant woman (sedentary work)

Food Composition	Amount (g/day)	Nutrient	Vegetarian diet	Non-vegetarian diet	EAR	RDA
Cereals & Millets	325	Energy (Kcal)	2060	2040	2480	-
		Protein (g)	71.7	71.6	54	68
Pulses (Legumes) ¹	90	Visible fat (g)	15	15	30	30
Green leafy vegetables	100	Calcium (mg)	980	970	800	1000
Other Vegetables	200	Iron (mg)	27.2	26.0	21	27
Roots & Tubers (excluding potatoes)	100	Zinc (mg)	13.1	12.8	12.0	14.5
Fruits	150	Magnesium (mg)	786	747	370	440
Milk	400	Vitamin A (µg)	1821	1818	406	900
Fats & Oils	25	β-carotene (µg)	9634	9597	-	-
Oil seeds & Nuts		Thiamine				

(gingely seeds & Peanuts)	40	(mg)	1.64	1.60	1.6	2.0
Spices	10	Riboflavin (mg)	1.8	1.84	2.3	2.7
		Niacin (mg)	16.0	16.7	14	16
		Vitamin B ₆ (mg)	2.0	2.0	1.9	2.3
		Vitamin C (mg)	210	210	65	80
		Total Folates (µg)	484	447	480	570
		Vitamin B ₁₂ (µg)	2.0	2.4	2.2	2.5

Check Your Progress Exercise 1

1) Explain why nutritional needs increase during pregnancy.

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2) List the types of foods a pregnant woman should take to meet the increased vitamin and mineral requirements.

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8.4 DO'S AND DON'TS FOR PREGNANT MOTHERS

Every mother wants to have a healthy baby. Here are some tips of do's and don'ts that may help you or help others who seek your advice.

Some do's:

- Have a check-up regularly at the same clinic.
- Eat a well-balanced diet.
- Have small and frequent meals.
- Take care of yourself, for your own sake as well as for the baby. (Be calm & happy)
- Pay attention to your skin, breasts, teeth and blood circulation.
- Do a few simple exercises. These help you to relax.
- Avoid over exertion and strenuous exercise.
- Include sufficient roughage in your diet to avoid constipation. Vegetables including leafy vegetables, fruits, whole grains, etc. provide roughage.
- Drink plenty of water.
- If you are a diabetic, have a regular check up and see that the diabetes is well under control.

Some Don'ts:

- Do not curtail your diet even for short periods. This is not advisable. Especially, eating too little cereals may harm the baby.
- Never take any drugs without a doctor's advice and supervision. Some drugs are harmful for baby.
- Smoking is harmful for the baby, so do not smoke
- Do not consume alcoholic drinks. But if you do, do it moderately.
- Do not get into conflicts which cause anger.

Check Your Progress Exercise 2

1) For a successful pregnancy what health practices should be followed by a pregnant woman?

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2) Is it harmful to satisfy cravings for special foods during pregnancy?

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8.5 PROBLEMS ENCOUNTERED IN PREGNANCY

During pregnancy, many women may suffer from problems like nausea and vomiting, constipation, toxæmia, etc.

8.5.1 Nausea and Vomiting

These are common in the early part of pregnancy. You may find that eating snacks often help to prevent and overcome this discomfort. You may find that high carbohydrate diet in the form of small feeds is helpful. Food like roti, toast or biscuits may help. You can eat a small amount of fruit or drink some fruit juice. It may be helpful to avoid strongly flavoured foods, tea, coffee and spicy or oily foods. Remember nausea is just a passing phase.

8.5.2 Constipation

This condition occurs because as pregnancy progresses, the enlarged womb presses against the intestines and prevents their normal movement. Include plenty of vegetables and fruits as well as whole grain preparations to provide roughage. A glass or two of water taken before breakfast is often helpful. Some people find warm water more helpful than cold water. Many women tend to decrease their physical activity. Exercise helps to prevent constipation and also keeps the body fit.

8.5.3 Toxaemia

Many women have swelling or puffiness around the ankles in late pregnancy. However in some women, especially in poorly nourished ones, this may be accompanied by high blood pressure and kidney problems. Toxaemia has serious effects on the baby. Some babies may have retarded growth or lung problems and some may even die. To avert toxæmia, a pregnant woman should have a nutritionally adequate diet.

8.6 RISK FACTORS FOR MALNUTRITION IN PREGNANCY

It is important for you to remember that there are some risk factors which may lead to poor nutrition and interfere with a successful pregnancy. These factors are:

- Age below 18 years.
- Having children one after another with too short an interval (say one year).
- If the mother has other children and there is a history of abortions or miscarriages.
- Chronic diseases requiring special diet.
- Drastically underweight or overweight at the start of pregnancy.

- Lack of sufficient food.
- Alcohol abuse or taking drugs.
- Medication without medical supervision.

Practical Activity 1

- 1) Meet any pregnant woman in your neighbourhood.
- 2) Record her food intake for 24-hours period, beginning with breakfast until she goes to bed at night.

Record the intake in household measures:

For example chapati/puri/idli/roti/papad, etc. are expressed in numbers. Indicate the number of servings of each food consumed in terms of one serving consisting of 30 gm of cereal.

Vegetables, raitas, salads, rice, khichadi are to be recorded in katoris. Specify whether the katori is small or large.

For dhal, soup, buttermilk record in terms of katoris. Indicate whether the dal is thick or thin.

Ghee, butter, honey, sugar, etc. are recorded in teaspoons.

- 3) Record food intake and other necessary information in the attached proforma:

Date of interview

Name

Age (Years)

Address

Month of Pregnancy.....

Vegetarian/Non-Vegetarian

Socio-Economic Group: Low....

Middle..... Hgh.....

Food Intake For One 24-Hour

Period

Meal	Menu Item	Number of Servings
Breakfast		
Lunch		
Afternoon		
Dinner		
Any other		

Check her food consumption with the Daily Food Guide you were given in Unit 3.

What are the number of servings she has consumed of:

Cereals and Millets	:	Protein Foods	:
Protective Vegetables and Fruits	:	Other Vegetables	:
Oil, Butter, Ghee	:	Sugar and Jaggery	:

Questions

- 1) Are the number of servings she is taking from each food group enough for her age and stage of pregnancy?

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- 2) If the diet is not nutritionally adequate, what may be some of the factors responsible for this state?

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- 3) If her diet is not nutritionally adequate, suggest modifications that she should make to have a well-balanced diet.

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- 4) Is she aware that her nutritional needs increase during pregnancy?

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- 5) Is her diet different from what she ate before pregnancy? How has her diet changed? Is she eating more or less than usual?

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8.7 LET US SUMUP

Growth is a major factor which influences nutritional needs. Growth rate is fast in prenatal life. During pregnancy, changes in both the mother and the foetus necessitate increased intakes of nutrients needed for growth. A pregnant woman should gain about 10-12 kg during the entire nine months. She should select foods which are rich in vitamins, minerals and proteins in addition to having a lot of energy. Malnutrition during pregnancy affects the developing baby. It may lead to a woman delivering prematurely or the baby

may be of low birth-weight. Curtailing dietary intake during pregnancy or having an unbalanced diet should be avoided. Fluid intake and consumption of vegetables and fruits should be ample and normally salt should not be restricted.

8.8 GLOSSARY

Embryo	: The developing baby during the 2nd to 8th week of pregnancy.
Foetus	: The developing baby from the 8th week after conception until its birth.
Implantation	: The stage of development in which the fertilised egg embeds itself in the uterine wall and begins to develop, during the first 2 weeks after conception.
Low Birth Weight	: A birth weight of 2500 gm or less, indicating poor health of the baby as well as poor nutrition of the mother.
Toxaemia	: A cluster of symptoms seen in pregnancy where blood contains harmful substances, swelling of feet, ankles, etc. is an indication.
Uterus	: The womb, the muscular organ within which the foetus develops during pregnancy before birth.

8.9 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

- 1) The baby in the womb of a pregnant woman grows at a very rapid rate. During this time the food required for growth is supplied by the mother through the placenta. The nutritional needs of the mother therefore increase considerably to provide adequate nourishment to the baby for its normal development.
- 2) Green leafy vegetables, fruits like amla, guava, papaya, mango, cereals, dhals and milk and milk products.

Check Your Progress Exercise 2

- 1) Have a regular medical check up
 - Eat a well-balanced diet
 - Pay attention to skin, breasts, teeth
 - Do a few simple exercises daily
 - Avoid over exertion
 - Drink plenty of water
 - Include adequate roughage in the diet to avoid constipation
 - Do not smoke or drink or get into conflicts.
- 2) As long as the craving for special foods do not interfere with good eating habits these foods may be consumed without worrying.

UNIT 9 NUTRITION THROUGH THE LIFE CYCLE - INFANCY

Infancy is a critical period of development which lays the foundation for future growth of a child. In this unit you will learn about the importance of breastfeeding, complementary foods and their role in the development of an infant.

Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Birth Weight, Normal Growth and Development
- 9.3 Nutritional Requirements of an Infant
- 9.4 Nutrition for Nursing Mothers
- 9.5 Breastfeeding
- 9.6 Breast Milk Substitutes
- 9.7 Complementary Foods
- 9.8 Let Us Sum Up
- 9.9 Glossary
- 9.10 Answers to Check Your Progress Exercises

9.0 OBJECTIVES

After studying this unit, you will be able to:

- describe the normal growth pattern of infants;
- identify the nutritional requirements of infants;
- list the advantages of breastfeeding; and
- list the foods you need to give in addition to breastfeeding.

9.1 INTRODUCTION

Infancy is a period of rapid growth. From the safe protected environment in the mother's womb, where it was nourished, the baby now comes into an environment which places a lot of stress on it. The baby has to make an effort to get the food it needs and has to cope with infections. Breastfeeding is unique and vital because it nourishes the baby and protects it from many infectious diseases. As the baby grows, mother's milk alone is not sufficient and one will need to give the baby other foods. Sometimes, if breastfeeding is not possible, one has to use a substitute for it.

In this unit we will study about the growth of babies in their first year, i.e., infancy, their nutritional needs and what they should be fed in this period. It helps to be constantly aware that the baby is helpless and needs constant attention and care.

9.2 BIRTH WEIGHT, NORMAL GROWTH AND DEVELOPMENT

In the previous unit, you have learned how vital it is for a mother to consume an adequate, well balanced diet during pregnancy. You know that if a mother is malnourished, her baby may be born with a low birth weight. The birth weight of an infant is important because it determines its ability to face life, to grow and develop normally.

Birth Weight: Under optimal conditions, you will see that the normal birth weight of infants is 2.5 kg, and the length will be about 50 cm. If the birth weight of a baby is less than the weight mentioned above, such an infant is said to have low birth weight. There are two main reasons for low birth weight: a) premature or early delivery, and b) when growth of the baby in the womb has been less than is expected or desirable.

Low birth weight infants may be small and wrinkled at birth. They may have some immediate difficulties, for example with breathing, in adapting to life outside the womb. However, if you provide optimal conditions after birth, low birth weight infants can gain in weight and catch up with other infants.

Normal Growth and Development of Infants: All-round growth and development of a baby is very rapid during the first year of life. You can see this from the weights at different ages for girls and boys in Table 9.1. Growth of the baby can be measured by using a growth chart as already explained in Unit 5. In these charts weight is plotted against the age. These growth charts help to identify growth failure at an early age so that corrective measures can be taken to prevent malnutrition.

Table 9.1: Weights of infants at different months in the first year

Age (Months)	Weight (kg.) (Median)	
	Girls	Boys
0	3.2	3.3
1	4.2	4.5
2	5.1	5.6
3	5.8	6.4
4	6.4	7.0
5	6.9	7.5
6	7.3	7.9
7	7.6	8.3
8	7.9	8.6
9	8.2	8.9
10	8.5	9.2
11	8.7	9.4
12	8.9	9.6
13	9.2	9.9

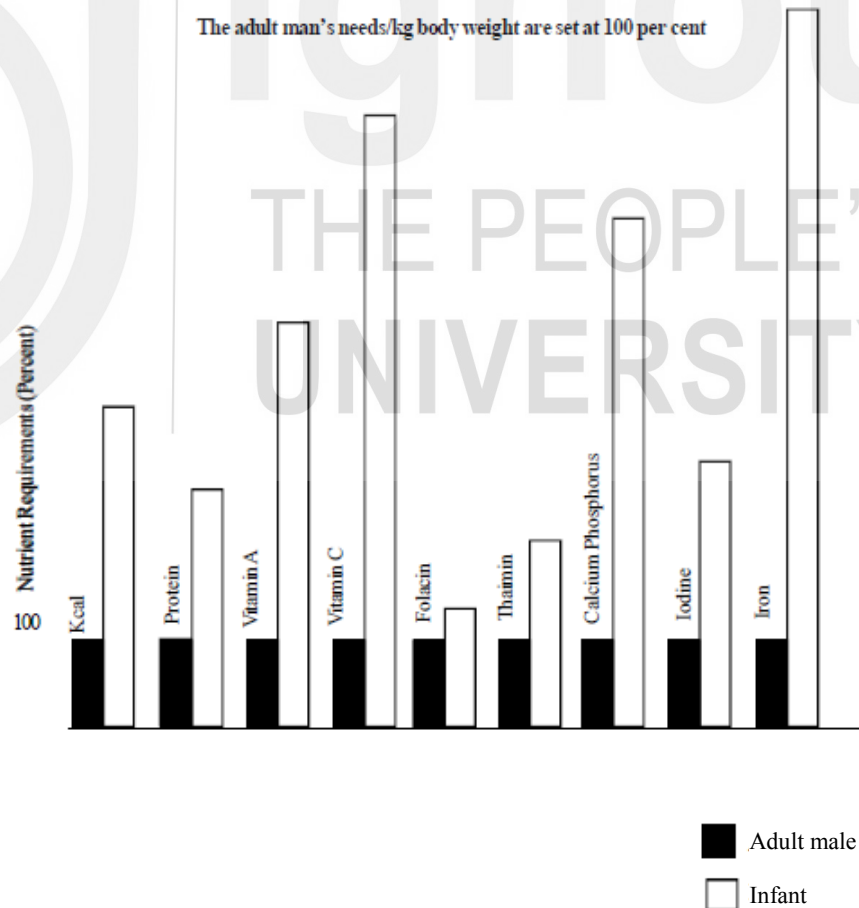
Source : The WHO growth standards (2006).

Internet source: www.who.int/childgrowth/standards.

Accessed on 12.6.09.

9.3 NUTRITIONAL REQUIREMENTS OF AN INFANT

The first year of life is a period of rapid growth and forms the foundation of future health of the child. The energy needs during infancy are high and the infant’s energy requirement per kg body are weight more than double that of an adult’s energy requirements per kg body weight. However, you may wonder how we arrived at this relationship. The RDA table gives the energy requirement of a sedentary man as 2110 Kcal, So, if we express energy requirement per kg body weight, we would get a Figure of 32.46 Kcal/kg body weight (i.e. if the reference weight is 65 kg then $65 \times 32.46 = 2109$ Kcal) approximately. Now, if you compare this figure with that for an infant, you would notice that the infant’s requirements (per kg body weight) are much higher. This means that the total figure would be higher in the case of the adult but the per kg body weight figure would be lower. The need for proteins, vitamins and minerals (per kg body weight) is also several times more in the case of the infant as compared to the adult. This would be more evident if you look at Figure 9.1.



Source :Whitney, E.N. and C.B, Cataldo. Chapter 16, page 573

Figure 9.1:Nutrient needs of an infant compared to those of an adult man.

Most babies in our country are breast-fed. Breast, milk alone is the sole source of nourishment for infants upto 6 months of age. In Unit 2 you were acquainted with the needs of infants, Since the mother has to nourish her infant, it is very important that a nursing mother should eat an adequate amount of food. If you do not feed the mother well, how would you have a beautiful and healthy baby? Let us discuss, therefore, what the diet of a nursing mother should be and then discuss about feeding of the infant.

9.4 NUTRITION FOR NURSING MOTHERS

If the mother has to successfully breastfeed and nourish her baby, it is important that she herself consumes an adequate diet. Generally mothers produce at least 600 to 800 ml of milk per day. In this milk are present all the nutrients that the baby needs. Thus during the period of nursing or breastfeeding you can see that a mother needs to consume more than her normal food intake. Refer to the energy, protein and other nutrient requirement for lactating shown in Table. 9.2.

Table 9.2 :Recommendations of nutrients for lactating woman (ICMR, 2020)

Lactation time period	Energy (Kcal/d)	Protein (g/d)	Iron (mg/d)	Calcium (mg/d)	Vitamin A (µg/d) (Retinol)	Vitamin C (mg/d)
0-6 months	+600	17	23	1200	950	+50
6-12 months	+520	+13	23	1200	950	+50

How would you supply this extra food? You may be familiar with traditions of feeding special preparations to a nursing mother. Many communities give a nursing mother kheer or laddus such as those made from methi, leafy vegetable, etc. All these foods provide energy, proteins, minerals and vitamins that the mother needs.

It is not always necessary to specially prepare such foods. You can meet the additional requirements of the mother by increasing some common food items in the normal diet such as chapati, dhal, etc., as shown in Figure 9.3..

Table 9.3: Additional Foods for a Nursing Mother



Foods	Additional Amount
Chapati	One
Rice	One katori
Dhal or	One katori
Egg or	One
Milk/curd or	One cup
Fish or	One piece
Nuts	25 gm
Any dark green	

leafy vegetable	One serving
Ghee/butter/oil/fat	Four to five teaspoons
Sugar / jaggery	Four to five teaspoons

Practical Activity 1

Meet any mother who is breastfeeding, in your neighbourhood. Record her diet. Evaluate her diet and see if she is eating well balanced diet.

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9.5 BREASTFEEDING

All babies thrive on mother's milk till 6 months of age since it is nature's ideal way of nourishing the baby. In India, breastfeeding is customary and hence most women need not be told to breastfeed their babies. However, you need to advise many women to feed their babies colostrum, which is the thick yellowish milk that is secreted in the first three to four days after delivery. Colostrum is a rich source of nutrients and also protects the infant against many diseases. In some communities colostrum is discarded which should be discouraged. Breast milk is the best choice of food for infants because breast milk is:

- 1) Adequate to meet the nutritional needs of the infant.
- 2) Easily digested and the nutrients from it are more easily absorbed.
- 3) Rich in substances which protect the baby from many infectious diseases.
- 4) The milk supply automatically adjusts to the baby's needs.
- 5) It protects the infant against allergy during its most vulnerable period.
- 6) It is economical, convenient and very clean.

Here are some guidelines for management of breastfeeding for mothers:

- Put the baby to the breast within an hour of birth.
- Let the baby be fed on demand, i.e., whenever it wants.
- Encourage cleanliness.
- Encourage exclusive breastfeeding till 6 months of age. Do not use any prelacteal feeds.
- Breast feed as long as possible.

- If the infant is too weak, expel milk from the breast and feed it with a cup/katori or spoon.
- Calm and quiet atmosphere favours maximal milk secretion.
- Continue breastfeeding during episodes of diarrhoea.
- Use oral rehydration solution to prevent and correct dehydration.
- Raw and cooked fruits and vegetables, whole grains and adequate amount of water should be included to avoid constipation.
- No food should be withheld from the mother unless it causes distress to the infants.
- The dietary intake of caffeine, artificial sweeteners and alcohol must be totally avoided.

9.6 BREAST MILK SUBSTITUTES

Sometimes it is not possible to provide breast milk to an infant as for example when the mother has some illness. In such cases you have to substitute the breast milk with other milk and have to copy nature as closely as possible. Usually you feed cow's or buffalo's milk as a substitute. However, cow's and buffalo's milk differ from human milk and have no anti-infective properties. Usually milk is diluted with water to make it easily digestible. However, this decreases the amount of energy available from the milk; consequently you must add sugar to ensure that the baby will get enough energy. In Table 9.3, you will see the amount of water and sugar that you need to add to make a feed for babies of different ages. Whenever you use cow's or buffalo's milk, boil it first to kill all harmful bacteria. Dilute the milk with boiled and cooled water when necessary.

Table 9.3: Preparation of Feed for Infants using cows or buffalo's milk

Age of Baby	Milk	Water	Sugar(teaspoons)
Cow's Milk or Toned Milk			
Birth to 2 weeks	1/2 cup	1/2 cup	2
2 Weeks to 2 months	2/3 cup	1/3 cup	2
2 Months to 4 months	3/4 cup	1/4 cup	2
Beyond 4 months	Undiluted	-	2
Whole Milk or Buffalo's Milk			
Birth to 1 month	1/2 cup	1/2	2

1 Month to 4 months	2/3 cup	1/3 cup	2
4 months to 6 months	3/4 cup	1/4 cup	2
Beyond 6 months	Undiluted	-	2

Cleanliness is extremely essential while preparing the milk. The following precautions should help to ensure protection of the infant from infection:

- If any milk is leftover in the bottle after a feed, do not leave it as it is. Use it in some family food preparation.
- Wash all bottles, nipples, spoons, cups, etc. with soap and water.
- Sterilise all the bottles, nipples, etc. by immersing them in boiling water for 10 minutes.
- Boil milk after dilution.

9.7 COMPLEMENTARY FOODS

The term “complementary foods” refers to those foods which are fed to the infant in addition to breast milk, providing sufficient nutrients. When would you begin complementary foods feeding. You already know that breast milk alone is quite sufficient until the baby is six months old. Generally the first solid foods are introduced around the sixth month and this occasion may be celebrated in your home (Annaprasana).

When and how do we introduce complementary foods? It is important that the introduction of complementary be an enjoyable period of transition. When you first offer an infant food, you may find that he spits it out. This is because the baby develops the ability to swallow very slowly. The child should not be forced to eat. You will find that the baby accepts the food better if it is not distracted. You can follow the guidelines given below for introducing complementary foods.

Guidelines for introducing complementary foods:

- 1) Complementary foods should be introduced at six months with small amounts of the foods which are increased slowly with frequent breastfeeding.
- 2) When you start a new food give only one teaspoon or two at a time, possibly after the breastfeed. If the infant does not take it, try again when he is hungry.
- 3) Wait a few days so that the baby is used to one food before you introduce another.
- 4) Once the baby accepts a new food, give it quite frequently so that it becomes familiar.
- 5) Practice responsive feeding.

- 6) Feed slowly and patiently and do not force feed the infant.
- 7) Minimise distractions during meals.
- 8) Experiment with different food combinations, tastes and textures to meet the nutritional needs.
- 9) Observe hygiene during preparation and feeding of infant.
- 10) Caregivers and child's hands should be washed before food preparation and serving.
- 11) Use clean utensils to prepare and serve food.
- 12) Store food safely and serve food immediately after preparation.
- 13) Avoid use of feeding bottles which are difficult to clean and sterilise.

Kinds of Foods Given : Normally cereals are the first foods to be fed. You can give cereals prepared for the family meals such as rice, chapati or phulka or bread soaked in milk. Rice can be mixed with dhal or curds or milk and mashed. By the 7th or 8th month the child should be taking about 4 to 5 teaspoons of the foods. Soft cooked dhal or steamed pulse preparations can be given by 7 to 8 months of age. You may be preparing dishes like khichadi, pongal, idli, dhoklas, etc. in your home. These can be fed to the older infant.

Fruits like banana, mango, papaya can be started at 6 months. Cooked apple after removing the fibrous parts can be given. By the time the baby is 6 to 8 months, you can begin giving it vegetables also. Initially you need to mash the cooked vegetable, and if necessary, strain it. By the end of the first year, you can change the consistency to coarsely mashed and then chopped vegetables. Vegetables and fruits supply the baby with minerals and vitamins and also make it get used to different textures and flavours.

Egg yolk (cooked) can also be given. Egg white, however, should be given only by the end of the first year, since some babies are allergic to it. Fish and meat can be cooked and mashed. Ground meat can also be given if tolerated. You can feed the baby alternately with fish/meat or egg yolk or dhal.

Increase the frequency of complementary food as the child grows older. An average healthy breastfed infant should be given complementary food 2-3 times a day at 6-8 months, 3-4 times a day at 9-11 and 12-24 months of age with additional nutritious snacks. Here is an example of what you can give to a 9-month old baby:

- Morning* : Cereal or boiled and mashed egg yolk with milk, e.g. dalia/porridge/ chapati/bread dipped in milk.
- Mid-morning* : Mashed fruit or fruit juice
- Afternoon* : Khichri/rice and dhal (mashed), dahi, mashed vegetables (seasonal) milk
- Tea* : Toast/biscuit, milk
- Late Evening* : Chapati (soaked in dhal/mashed), mashed fruit, (seasonal)
- Night* : Milk

Locally available food materials can be used for preparing low cost complementary foods. Commonly used foods such as cereals (wheat, rice, ragi, jawar, bajra, etc), pulses (grams/dhals), nuts and oilseeds (groundnut/groundnut oil), sugar or jaggery and seasonal fruits and vegetables should be used as they are cheap and available in plenty.

Precautions in Infant Feeding

Given here are some precautions which when followed will help the infants maintain good health.

- 1) The leftover milk in the bottle should not be fed to the baby at the next feed.
- 2) Frequent small feeds are to be encouraged.
- 3) Avoid seasoned foods and strong flavoured foods as supplements.
- 4) Keep all utensils clean and sterile.
- 5) Keep hands and fingers and finger nails clean.
- 6) Discourage use of commercial baby foods which are expensive.

Check Your Progress Exercise 1

- 1) What are complementary foods ? Plan the type of foods you can give to a one year old infant.

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- 2) What advice will you give to a mother-to-be, about feeding her infant in the first 6 months?

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Practical Activity 2

- I) Visit any one family in your neighbourhood where they have an infant 6 to 12 months of age.
- II) Record the kind of milk other than mother's milk that is given to the baby.

Kind of Milk	Amount of milk (in cups)	Amount of water*to dilute the milk	Sugar (tsps)

***Check sources of water**

Question

a) When was this milk introduced to the infant?

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b) Is the proportion of dilution correct? If not, what are the correct proportions you would suggest for preparing the feed?

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c) How is the feed prepared?

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d) Is the milk fed with a bottle to the infant? Yes/No.

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e) Is it fed with a katori and spoon? Yes/No.

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Handling of Milk

a) How are the utensils/bottles, etc. (used to feed the baby) washed?

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b) Are they sterilised? Yes/No How?

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c) What is done with the leftover milk from a child's feed?

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d) Is the milk stored appropriately?

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Complementary Foods

Record the complementary foods given to the infant in the proforma below:

Time of the day	Food given	Amount	Briefly describe whether sugar/salt, etc. are added and the amount

a) When were the complementary foods first introduced to the child?

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b) Which was the first food to be introduced?

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c) Evaluate the foods given against the daily food guide. Is the infant getting foods from all the five food groups? If not, suggest some foods that can be included.

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9.8 LET US SUM UP

Infancy is one of the most rapid periods of growth in life. Human milk is ideally suited to the needs of the human infant. It is important to feed colostrum to the infant. In order that a mother can nurse her baby successfully, she should consume one-and-a-half times in amount her normal diet. After 6 months of age, milk alone is not sufficient for the baby's needs. Other foods, i.e., solids should be introduced into the infant's diet at this age. By one year, the child should be able to eat most of the foods that are eaten by adults. When it is not possible to feed a baby with mother's milk, cow's or buffalo's milk, can be used after suitable modification observing principles of hygiene.

9.9 GLOSSARY

- Colostrum** : A yellowish sticky fluid secreted in the first few days after delivery. A concentrated source of proteins and disease-resistance factors.
- Low Birth Weight** : Birth weight below 2500 grams.
- Premature Infants** : Infants born before completion of 37 weeks of pregnancy.
- Complementary Food** : Foods which are fed to infants in addition to breast milk.

9.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1) Complementary foods refer to those foods which are fed to the infant in addition to breast milk, providing sufficient nutrients. The infant is introduced to semi solid and solid foods so that it slowly becomes accustomed to an adult diet. Diet for a one year old infant

- Morning : 1) Cereal e.g. dalia/porridge/bread with milk.
 2) Boiled egg.
 3) Milk to drink.

Mid-Morning : Fruit juice

Afternoon : Vegetable Khichri and some butter/curd.

Tea : Biscuit Toast, Burfi, Milk.

Late Evening : Vegetable soup, khichadi or roti mashed with dhal
mashed Potato or banana.

Night : Milk

2) Advice on feeding an infant in the first 6 months:

- Colostrum should be fed to the child after birth
- Initially the baby should be fed on demand
- Until the baby is 4-5 months old, only boiled and cooled water may be given in addition to breast milk
- If breast milk is not sufficient, substitute milk should be given taking the necessary precautions
- Cleanliness should be maintained at all times
- Infant should be fed in a quiet atmosphere.



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UNIT 10 NUTRITION THROUGH THE LIFE CYCLE – PRESCHOOL AGE

Preschoolers are children below six years of age (between age of 1-6 years). In this unit we will learn about their nutritional needs relating to their developmental pattern and their proneness to infection.

Structure

10.0 Objectives

10.1 Introduction

10.2 Physiological Development and Food Intake

10.3 Development of Food Habits

10.4 How Would You Meet the Nutritional Requirements of a Preschooler?

10.5 Role of Infection in Causing Malnutrition

10.6 Let Us Sum Up

10.7 Glossary

10.8 Answers to Check Your Progress Exercises

10.0 OBJECTIVES

After studying this unit, you will be able to:

- state the nutritional needs of preschool children;
- suggest solutions to problems you may encounter in feeding the preschool child;
- help preschool children to develop good food habits; and
- explain the role of infection in causing malnutrition.

10.1 INTRODUCTION

Until a child is twelve months old, you call him an infant. After twelve months, we call him a toddler. Preschoolers are children who are below six years of age. Look at children of this age group, i.e., between the ages of one and six. What do you observe? From being totally dependent as an infant these children can crawl or walk and talk and also run and play. All these activities will influence the amount of food the preschoolers eat. This is the age when food habits are formed. The preschool years, therefore, are important in the child's life because they form the foundation for a lifetime of good nutritional and health practices. In this unit the developmental characteristics of a preschool child are explained with special focus on nutritional needs. The preschool age is described as a critical stage for formation of food habits and for proneness to infections.

10.2 PHYSIOLOGICAL DEVELOPMENT AND FOOD INTAKE

From your own experience, you may know that preschoolers are very active. The preschooler, like all children, is growing and starts gaining control over his body and movements. These changes ensure three characteristic aspects you can now expect: the child can *eat by himself*, he can *eat the same food that the rest of the people in the family do*, and *his appetite may be small as compared to that in infancy*.

Children of this age have wrist control which means that they can hold a cup and drink and also eat by themselves. Of course a two-year old may not eat as neatly as adults do and may spill some food. However, as he gets older he will be able to eat neatly.

By the time he is about one or one-and-a-half year old, your preschool child should be eating the same food as the rest of the family. But you must not give him very spicy food. This is because his digestive tract is still not able to tolerate the spicy food that adults can eat. Most of a preschooler's nourishment should come from solid foods, though he/she may still have some milk as well. It is not advisable to give oily foods to the child. This is because such foods stay in the stomach longer. As a result the child may not be hungry at the next meal and may eat less than he should.

During the second and third years, preschoolers need less food than you expect. You, as an adult, may think that this is poor appetite. Mothers are very concerned about such a sudden change. In Unit 5, you learned that preschoolers do not grow as rapidly as they did during infancy. Naturally the child's body regulates itself by having a smaller appetite. The amount of food eaten will vary from one child to another. You may find that the same child eats well at one time and small amount at another.

As the child grows and becomes more and more active, he will lose some of the chubbiness and become lean. As long as a child is active, healthy and growing at an acceptable rate you should expect these changes as characteristic of this group. You should worry only if the child is repeatedly falling ill, is lethargic and apathetic and has not gained weight for a prolonged period.

10.3 DEVELOPMENT OF FOOD HABITS

In the preschool years, as you may have seen, food often takes, second place because the child is interested in so many different things. It is at this age, however, that you can inculcate the right attitudes and good food habits. As in everything else, parents and elders are the most important influence in the child's life because the child imitates his parents and elders using them as models.

As a parent, you can do a few things to ensure that your child develops good food habits:

- It is better not to transmit your dislikes and likes to the child. If you dislike certain foods, do not pass it on to the child. In many families, certain vegetables and foodstuffs are not even brought into the home and used, because one or the other parent dislikes it. This is not good. Let your child try all kinds of vegetables and fruits.
- The foods you offer to the child should be well prepared and attractive. This is something that not only a small child, but all of us would like.
- Be patient with your child even when he is messy in eating. If you are impatient you may hinder his ability to eat by himself. Praise him when he eats all his food.
- Let him eat with the rest of his family. Discourage him from having snacks instead of regular meals. Eating too many sweets or snacks is not only monotonous but will give him only energy without the other essential nutrients. Sweets also lead to tooth decay. Snacks affect healthy appetite.
- Never use food as a bribe for good behaviour or punish the child by not giving him food, especially the foods he likes. Chocolates, sweets, etc. should not be used as bribes. You may unwittingly lead the child to believe that such foods are good.
- Encourage physical activity and play to prevent obesity.

Many children begin mouthing objects in the middle of the first year. Basically this reflects the normal hand-to-mouth coordination stage of development. This type of activity usually subsides early during the second year.

Check Your Progress Exercise 1

- 1) How does the growth of a preschool child differ from that of infants?

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- 2) What points should you keep in mind so that the child will develop good food habits?

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10.4 HOW WOULD YOU MEET THE NUTRITIONAL REQUIREMENTS OF A PRESCHOOLER?

You already know that preschoolers are still growing at a slow but steady pace. Therefore, all the nutrients that were important during infancy are still essential for the preschooler. Thus giving a well balanced diet is a must. Unit 3 has given you some knowledge about balanced diets.

The preschool child, like the infant, needs more protein than adults do. Therefore, his diet should contain enough cereals and pulses and if you are non-vegetarian, you can give him/her egg, meat and fish. Milk should not be overemphasised because the child should be eating all foods and dishes that are prepared in your home. The preschooler's diet should be varied and have a lot of vegetables and fruits, such as green leafy vegetables, yellow and orange vegetables and fruits like carrot, pumpkin, papayas or mango. Also give fruits like guava, amla, mausambi, orange or mango. Remember seasonal fruits are cheaper in season. Include a leafy vegetable preparation at least 2 or 3 times, a week. This is especially important since vitamin A deficiency is a nutritional problem in our country.

Here is a sample menu for a toddler (upto 2 years old) and a preschooler (4 to 5 year old).

Meal	Two Year Old	Four/Five Year Old
Breakfast	1 Chapati/1 slice bread Egg-1/2 to 1 (optional) Milk-1 glass	2 Chapati/2 slices Bread, egg-1 (optional) Milk-1 cup
Mid-morning	Chikki-1 piece One piece fruit (guava/chickoo/banana)	Chikki-1 to 2 pieces Fruit-1/2 or 1 small
Lunch	Rice-1/3 katori Chapati - one Dhal-1/3 katori Palak potato bhaji Curd	Rice-1/2 katori Chapati - one or 1½ Dhal-1/2 katori Palak potato bhaji Curd
Tea	Poha-1/2 katori or biscuits 2-3 Milk-1 cup	Poha-3/4 katori or biscuits 3-4 Milk-1 cup
Dinner	Khichdi-3/4 katori Papad, Raita, Fruit	Khichdi-1½ katori Papad, Raita, Fruit
Night	Milk-1 cup (optional)	

10.5 ROLE OF INFECTION IN CAUSING MALNUTRITION

Preschoolers like children of any other age will have some health problems. Among all the problems or illnesses, you may have seen, diarrhoea and dysentery are quite common. Most cases of diarrhoea are caused by the child consuming some food or liquid which was contaminated by harmful bacteria.

Infections and intercurrent illnesses play an important role in precipitating nutritional deficiencies. In the first year of life the child is breastfed, to protected against disease by its mother's milk. After 6 months, however, as the child's milk intake may gradually decrease, the protection it receives is also less. It takes some time for the child's body to build up its defence systems. Under these circumstances the child in the early preschool years is more susceptible to infection than during later years.

Take any illness like fever, diarrhoea or measles. The illness is a stress on the body and causes loss of weight in the child. If the illness is severe and of long duration it may slow down the child's growth. You know that when you are ill you do not feel like eating. Thus, the child may eat less than he does normally although at such a time, he actually needs more food. Some families may restrict food during the illness and sometimes you will find that some people do not even give water to a child suffering from diarrhoea.

It is very important that you feed a child during his illness. Give the child easy-to-digest foods with less spices and oil. Include foods from all the food groups especially from Group 3. You may have to feed the child frequently giving him small amounts at a time. Khichadi, soft cooked rice and dhal, vegetable soups, cereal and milk porridge are easy to digest and are foods you must be familiar with.

After the child recovers, care must be taken to provide sufficient nutrition so that the child can catch-up and put on weight. During the recovery stage, the child needs more food to make up and put on the weight he may have lost.

Suppose a child does not get sufficient food he/she is exposed to infection once again. Before the child has had time to recover and catch-up with the growth that he has not been able to achieve, he will fall ill again. This second illness will make the child weaker than he was before. If this happens repeatedly, the child will soon be underweight and may eventually become malnourished. A malnourished child is more susceptible to infection. So the cycle goes. Figure 10.1 describes vicious cycle of infection and malnutrition.

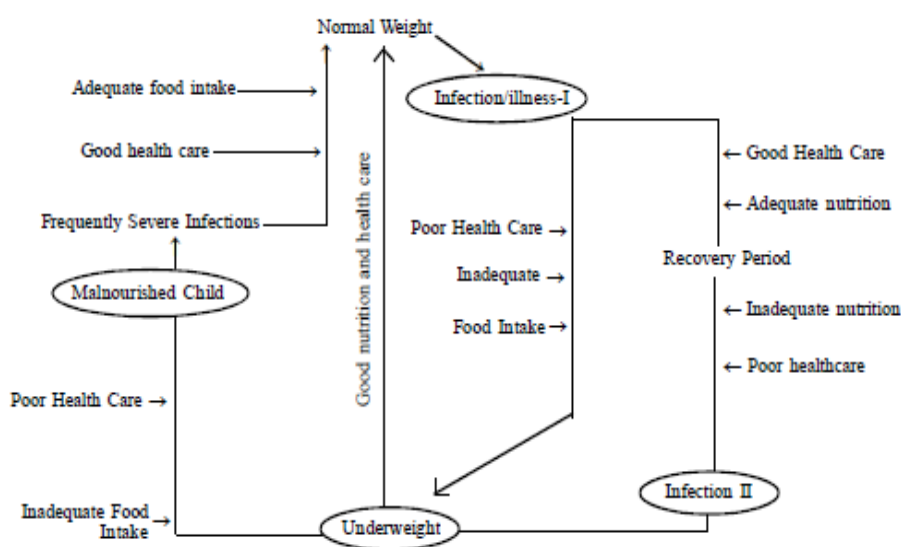


Figure 10.1: Vicious cycle of infection and malnutrition

Suppose a child in your family has diarrhoea, what do you do normally? You may be aware that diarrhoea and dysentery make the child lose a lot of body water. It is important, therefore, to give the child plenty of water. Here is a suggestion for making a simple drink for the child. Take 1 glass of water which has been boiled and cooled. Add one tablespoon of sugar and a pinch of salt to it. If you wish, you can add some lemon juice to it as well. Give this to the child: one glassful for every motion he has, a few teaspoons at a time.

However, this is only a temporary measure. You should give the child other foods also. As soon as you can, give the child soft cooked rice, banana, khichadi, rice, kanji, etc. It is not necessary to restrict food to the child when he is ill. However, spicy food is restricted.

Check Your Progress Exercise 2

- 1) What kinds of food and how much food will you give to a three-year-old child? Give a sample menu.

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- 2) How is infection and malnutrition related?

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Practical Activity 1

DIETARY PRACTICES FOLLOWED IN DIARRHOEA

A) Record dietary practices followed in your family when a child is suffering from diarrhoea.

- 1) Foods included in the diet during diarrhoea

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- 2) Foods avoided during diarrhoea

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B) Record dietary practices followed in your family when an infant is suffering from diarrhoea.

1) Beverages and gruels (thin liquid foods) fed to the infant

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2) Food and beverages avoided during diarrhea

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3) Amount of water given

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10.6 LET US SUM UP

Providing adequate nutrition & health care to preschoolers is as important as it is for infants. From being totally dependent, the child is now able to move, control his movements and communicate. Preschoolers can feed themselves. Often appetite decreases in these years mainly because needs for growth are less and because the child is involved in many other activities. Food habits which will last a lifetime are established at this age, with parents being an extremely important influence. Illness depletes nutrient stores of a child and makes him lose appetite and eat less food. After recovery it is important to give sufficient food so that the child can catch-up and put on the weight he may have lost.

10.7 GLOSSARY

Diarrhoea : Frequent and watery stools.

Dysentery : Stools with mucous and or blood.

Measles : Infectious disease with fever, rash, cold and cough symptoms.

Preschool : Stage before the child goes to school (Extends from 1 to 6 years).

10.8 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1) The growth of an infant is much more rapid than that of a preschool child. However while the infant is totally dependent, the preschool child

slowly begins to gain control over his body and movements and learns to do things by himself. As a preschool child grows he becomes more and more active and loses some of the chubbiness of infancy.

- 2)
 - The child should be encouraged to try all kinds of vegetables and fruits.
 - Foods for the child should be attractive and clean.
 - The child should be encouraged to eat by himself even if he is messy.
 - Too many sweets should not be encouraged.
 - Chocolates and sweets should not be offered as incentives for good behaviour.

Check Your Progress Exercise 2

- 1) A three year old child should be given cereals, pulses (egg, meat, fish, if nonvegetarian), fruits, vegetables and milk.

Sample menu for a 3 year old:

Breakfast	: 1/2 besan palak roti, 1 glass milk or Sandwich (of 2 slices), 1 glass milk or Bread butter-2 Slices, 1 glass milk
Lunch	: Chapati 1½, rice 1 katori, ½ katori dhal, ½ katori vegetable, dahi-1/2 katori
Tea	: 1 cup milk, biscuits 2-3 or Poha/upma 1/2 katori, milk-1 cup
Dinner	: Khichadi-1 katori, raita/vegetable- ½ katori/fruit
Night	: Milk -1 cup

- 2) A preschool child is more prone to infection than the older child because his defence mechanism is not built up. When a child falls ill he is not able to eat so he loses weight. If the illness is long or is recurring, soon the child will be underweight and malnourished. A malnourished child is very weak so will fall sick very easily. So a cycle is created between illness and malnutrition.