

---

# UNIT 8 MEAL PLANNING FOR PREGNANT AND LACTATING WOMEN

---

## Structure

- 8.1 Introduction
- 8.2 Pregnancy
  - 8.2.1 Recommended Dietary Allowances for the Pregnant Woman
  - 8.2.2 Meal Planning for the Pregnant Woman
- 8.3 Lactation
  - 8.3.1 Recommended Dietary Allowances for the Lactating Woman
  - 8.3.2 Meal Planning for the Lactating Woman
- 8.4 Let Us Sum Up
- 8.5 Glossary
- 8.6 Answers to Check Your Progress Exercises

---

## 8.1 INTRODUCTION

---

In the last unit you learnt that adulthood represents the stable state in life, that is all growth in terms of body size has been completed. The nutrient need is for maintenance rather than for growth. But in the life of an adult woman there may be two phases, namely Pregnancy and Lactation, when there are sharp increases in nutrient requirement. What are these two stages? Why does the nutrient need increase during these two stages? You shall learn about these aspects in this unit.

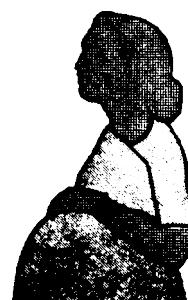
*Pregnancy* is the period in the life of an adult woman when the foetus, i.e. the unborn baby, grows inside her body. To support the growth of the foetus, certain physiological changes take place in the woman's body. These changes, along with the growth of the foetus, necessitate an increase in the nutrient requirements of the woman. *Lactation* on the other hand, is the period following the birth of the child when the mother breastfeeds her baby. The baby, for the first six months after birth, depends totally on breast milk for nourishment. Breast milk contains several nutrients which of course are supplied by the mother. Hence, more food is required by the woman during lactation to help meet the additional nutrient requirements.

As you read the unit it will become clear that there are heavy demands on the mother during pregnancy and lactation. This is the reason why a proper diet is of crucial importance during these phases. What are the foods that must be included in the diet of the pregnant/lactating woman? To what extent should the diet be modified to meet the increased need? How to plan balanced meals for a pregnant/lactating woman? We shall examine all these aspects in this unit.

### Objectives

After studying this unit, you will be able to:

- describe the various physiological changes that take place in the woman's body during pregnancy and lactation;
- discuss the nutrient needs of the woman during pregnancy and lactation; and



- state the dietary considerations to be followed to ensure successful pregnancy and lactation.

## 8.2 PREGNANCY

Pregnancy is a period of about 9 months. It is the period when the foetus i.e. the unborn baby grows inside the woman's body. Let us understand the process of growth.

Life for the human being begins with the meeting of two cells namely the egg (from the mother) and the sperm (from the father) inside the woman's body (Figure 8.1). The egg and the sperm unite to form a single cell. This tiny, single cell migrates to the uterus and it is there that it eventually grows to form the foetus. This single cell first divides into two cells, then four, eight and many such cells. As a result, there is a tremendous increase in cell number. Cell size also increases. But we must remember that all cells are not the same. Gradually cells become specialised in structure and function. Cells of similar type align themselves to form tissue. Such tissues then form the organs of the body. Growth and development of these organs continues. Growth as you may already know refers to the physical increase in the size of the body and its organs. Development, on the other hand, denotes a qualitative change. It refers to an increase in complexity of body functioning. In a period of about 270 days or 40 weeks the foetus grows from being a tiny single cell to a weight of almost 2.5-3 kg.

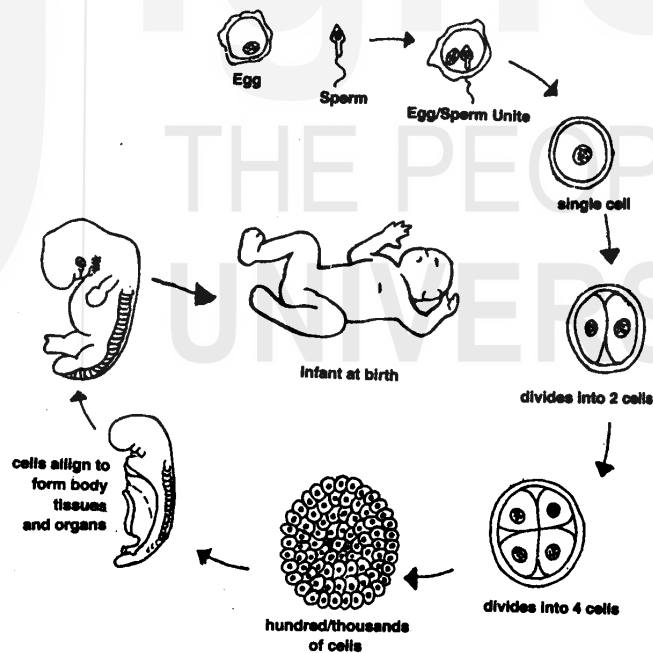


Figure 8.1: Growth and development of the foetus

You can make out from the above mentioned sequence of events that a foetus grows and develops very rapidly. The foetus takes all the nutrients required for its growth from the mother's body. How does the foetus do that? The foetus is nourished by the placenta. What is placenta? Look at Figure 8.2. Can you spot the placenta? The placenta is the spongy tissue which develops in the uterus only during pregnancy. The foetus is attached to the mother through the umbilical cord which in turn is attached to the placenta. Within the placenta oxygen, nutrients and waste products are exchanged between the mother's blood and that of the foetus.

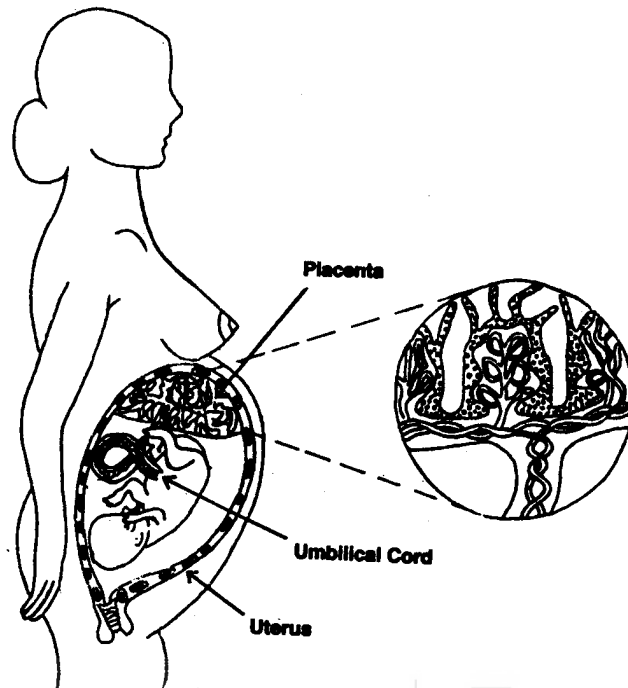


Figure 8.2: The Placenta

From our discussion above you would have got an idea of how pregnancy is associated with certain physiological changes that take place in the woman's body. To facilitate the nourishment of the foetus, for example, the placenta develops. Likewise, there are few other physiological changes characteristic of pregnancy. Let us now examine these physiological changes:

- a) **Changes in body organs:** Along with the development of the placenta the following changes take place in body organs:
  - the uterus and its supporting muscles increase in size to accommodate the growing foetus and
  - the breast grows in size and prepares to produce milk.
- b) **Changes in body metabolism:** The basal metabolic rate (BMR) increases during pregnancy. Why does the body metabolism increase? You remember reading in Unit 7 that rapid growth periods are associated with increased BMR. Pregnancy is characterised by rapid growth and development of the foetus and the mother's tissues. Due to this rapid growth and development the basal metabolism increases.
- c) **Changes in the body fluids:** There is a gradual increase in the total fluid (extracellular and intracellular fluid) content of the body. Blood, (the major portion of the extracellular fluid of the body) increases in volume. The increase in blood volume is as much as 50 per cent. Why does the blood volume increase? This is to facilitate the supply of nutrients to the foetus and to the newly built tissues in the mother's body. However, due to the increase in blood volume, the concentration of haemoglobin (Hb) and other constituents of blood reduces. The normal Hb level of 12 mg/100 ml of blood as seen in a healthy adult woman drops to about 10-11 mg/100 ml during pregnancy. This is a normal physiological change. Care should be taken that the Hb levels do not fall below this point.

d) **Changes in digestive functioning:** One important adaptation of the body during pregnancy, is the *increased rate of absorption of certain important nutrients* like *calcium and iron*. The absorption increases so as to meet the increased demands of the body. Along with the increased absorption, the following changes in the digestive functioning are also observed:

- There is less production and secretion of acid and other digestive juices by the stomach. The food therefore is not broken down and digested properly. It tends to stay in the stomach for a longer time and that gives a *feeling of heaviness or fullness*.
- The capacity of the stomach and the speed of digestion tend to decrease as the growing foetus exerts pressure on the stomach. The food, as well as, the stomach acid, tends to be pushed up into the food pipe which leads to *nausea, vomiting, heartburn and, other such symptoms for indigestion in early pregnancy*.
- The movement of food in the digestive tract becomes slow and sluggish as the muscle activity is altered. This becomes more pronounced at the end of the pregnancy period, as a result, *constipation commonly occurs*.

e) **Changes in the body weight:** During pregnancy a woman gains weight. What do you think contributes to this weight gain? The gain in weight is due to the:

- growing foetus
- increase in the size of the uterus
- development of the placenta
- increase in breast size
- increase in blood and total body fluids, and
- deposition of fat in the body (which would be needed to supply energy at the time of breast feeding the baby).

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 10-12 kg. i.e. a pregnant woman must add 10-12 kg to her pre-pregnancy weight.*

The entire period of pregnancy is actually divided into three trimesters:

- 1st trimester – 0-3 months
- 2nd trimester – 3-6 months
- 3rd trimester – 6-9 months

There is a progressive gain in weight during these three trimesters. It is, however, observed that the maximum weight gain occurs only during the second and third trimester. Why is this so? This is because maximum growth of the foetus, as well as, the maternal tissues takes place only during this period (i.e. fourth month onwards). The gain in weight during the first three months (i.e. the first trimester) is, however, limited as the foetus is very small.

*Gain in weight is, therefore, considered the best indicator of a successful pregnancy.* Progressive gain in weight indicates that the foetus and the mother's tissues are growing normally. A gain in weight of less than 10 kg is indicative of the



In Table 8.1, you would have noticed that the RDA's for energy, protein, vitamin C and B vitamins are given in terms of additional allowances (indicated by the "+" vitamin C) and for all other nutrients as total intake figure.

A woman during pregnancy requires 350 kcal and 9.5g and 22g, during 1st and 2nd trimester respectively, protein in addition to what she needs when non-pregnant. To illustrate, a sedentary woman during pregnancy would require a total of 2010 Kcal (i.e. 1660+350 and 63.5g protein (i.e. 54.0+9.5). Physically active pregnant women and pregnant adolescent girls (i.e. girls between 13-18 years of age) would, however, require more as compared to sedentary pregnant woman. Pregnant adolescent girls would need more nutrients to support their own growth, as well as, the growth of the foetus. (A detailed discussion on pregnancy during adolescence is given in Highlight 6, Unit 10.) The requirement for B Vitamins- thiamine, riboflavin and niacin – is based on the energy requirement. The greater the energy need, the higher would be the B vitamin needs.

The RDA's for almost all nutrients increases during pregnancy, but the requirement for a few specific nutrients increases substantially. *These nutrients include energy, protein, calcium and iron.* Besides *iron, magnesium, iodine and zinc* are the other three trace elements which are of vital importance during pregnancy. The ICMR, Expert group committee (2020) recommend an intake of 220 µg/d of Iodine for pregnant women.

The next question that might come to your mind is why is the need for these specific nutrients more during pregnancy? Let's consider. Extra energy is needed to:

- support the growth of the foetus and placenta
- add to the fat reserves of the mother and
- compensate for the increased energy expenditure as a result of higher basal metabolic rate.

The need for protein is more as this nutrient is required for the synthesis of new tissues in both the mother and the foetus. Iron is needed for the synthesis of haemoglobin in the foetal blood cells. In addition, the foetus accumulates abundant stores of iron in the body to last through the first three to six months of life after birth. This further raises the iron requirement. The need for calcium increases to support the mineralization of bones and teeth in the foetus. As for the trace elements – zinc is required for growth and protein synthesis and iodine helps to regulate the physical and mental growth of the foetus.

*It must be emphasized here that the requirement for most nutrients increase only from the second trimester onwards. Why? You are already aware, that in the first trimester (0-3 months) the foetus is small and its nutritional needs are not significant. Hence, no extra amounts of nutrients are recommended for the mother.*

The foetus obtains all these nutrients required for its growth from the mother's diet. If the diet is inadequate, the woman's tissues will be broken down to supply these nutrients to the foetus. Hence, though the diet during pregnancy does count, entering pregnancy in good nutritional status is also very important. A well nourished

woman with adequate nutrient reserves will be better equipped for a successful pregnancy.

**Check Your Progress Exercise 1**

1) State whether the following statements are true or false. Correct the false statements.

a) The foetus grows in an organ called the placenta in the woman's body. (True/False)

.....  
.....

b) The foetus obtains all the nutrients it needs from the woman's diet. (True/False)

.....  
.....

c) The haemoglobin level increases during pregnancy. (True/False)

.....  
.....

d) The probability that a woman who gains 7 kg weight during pregnancy, will give birth to a healthy baby is high. (True/False)

.....  
.....

e) The foetus accumulates abundant stores of vitamin A during pregnancy. (True/False)

.....  
.....

f) The requirements of energy and protein increase right from the first trimester of pregnancy. (True/False)

.....  
.....

g) The requirement of B vitamins does not increase during pregnancy. (True/False)

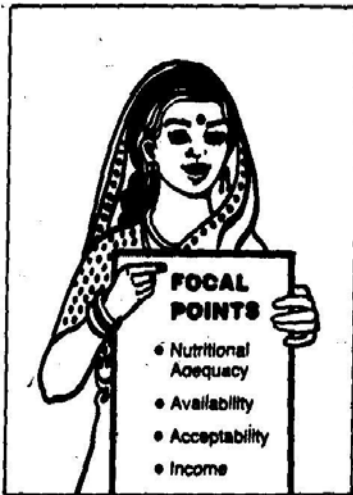
.....  
.....

h) The stage of pregnancy influences the nutrients requirement. (True/False)

.....  
.....

2) Why does the need for nutrients increase during pregnancy?

.....  
.....



## 8.2.2 Meal Planning for the Pregnant Woman

The stage of pregnancy is likely to cause changes in the pattern of life, as well as, eating habits of the woman. You are aware that right from the initial stages of pregnancy certain changes in the body functioning occur. These changes necessitate modification in the meal patterns. Further, the nutrient requirement also increases because of which qualitative and quantitative changes need to be made in the meals. In this section, we shall learn about the various changes and the basic factors that need to be considered while planning meals for pregnant woman.

To begin with, do you recall the basic four factors that one should keep in mind while planning meals? They are listed in the margin for your reference. In addition to these factors the other points to be considered include:

### Whom are we planning for?

- Is the woman in the first trimester (0-3 months), second trimester (3-6 months) or the third trimester (6-9 months) of pregnancy?
- What is the income level of the woman—does she belong to the high income group, middle income group or the low income group?
- Which region (part of the country) does she belong to?

Information on these aspects would help you specify the kind and amount of food to be selected. The stage of pregnancy would also help you to specify the nutrient requirement. After identifying the individual you can list the RDA's accordingly.

### Which nutrients are of particular importance?

You have just read that the requirement for almost all nutrients increases during pregnancy. But the requirement for a few specific nutrients is considerable. These include:

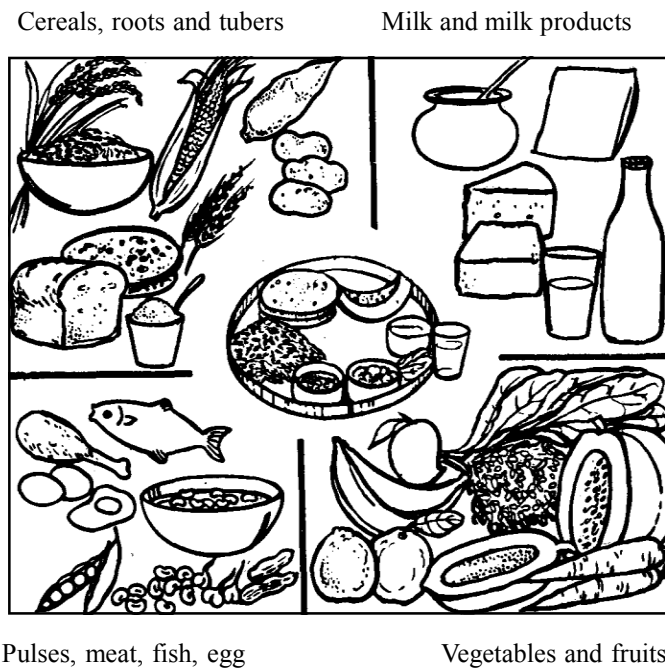
- energy-giving nutrients (carbohydrates and fats)
- proteins
- calcium and
- iron

It is however important to remember that the requirement of these nutrients *increases only from the second trimester onwards*.

### Which foods to select?

Generally a mixed diet consisting of food items from each of the three major food groups (namely energy-giving, body-building, protective/regulatory) would help meet the requirement. But you are aware that the requirement for energy, protein, calcium and iron is maximum during pregnancy. Hence, from the three major food groups, include more of cereals, pulses, milk and milk products, green leafy vegetables in the diet (Figure 8.4). Meat/fish/poultry, eggs may be included if acceptable. Also, if income permits nuts/oilseeds may be considered. For your reference a list of food items rich in energy, protein, calcium and iron is given in Annexure-1 at the end of the block. You can consult it while selecting the food items.





**Figure 8.4: Foods to emphasize during pregnancy**

A pregnant woman from the low income group may not be able to consume much of milk, meat, nuts, fat/oils. So, then the crucial question is what food items should she select that would enable her to plan nutritious meals at low cost? Do you recall the discussion we had in Unit 7 on how to plan nutritious meals at low cost. Planning meals keeping those points in mind will ensure balanced meals for pregnant women of low income groups as well.

It is important to mention here that iron from food sources alone may not be sufficient to meet the increased needs of iron during pregnancy. Additional iron in the form of tablets usually needs to be given. It is suggested that right from the second trimester onwards a pregnant woman should take an iron tablet providing 100 mg iron and



**Figure 8.5: Give iron/folic acid tablets during pregnancy**

500 µg folic acid daily (Figure 8.5). From where does one get these tablets? The tablets are easily available from the primary health centres or the ICDS (Integrated Child Development Services) anganwadis where they are distributed free of cost. Alternatively, one could also buy them from the open market at a minimal cost.

Another point to remember is that one should use iodised salt for cooking. This will help to meet the iodine need during pregnancy.

**Are there any special food preparation for the pregnant woman?**

You must have observed mothers or mothers-in-law preparing and serving special food items to their pregnant daughters/daughters-in-law. In the North, for instance, pinni/panjiri is commonly served, likewise payasam in the South, and methi-pak in the West. In most regions it is customary to serve such specific food preparations during pregnancy and lactation. What are these special food preparations? Why should they be served during pregnancy? These special food preparations are energy/protein-rich snacks made of cereals/pulses/fats/nuts/special herbs. In addition to calories and proteins they provide sufficient amounts of other essential nutrients like calcium or iron or vitamin A. Usually these food preparations are served in between meals and together with the meals they help meet the increased needs during pregnancy. Some of the common traditional food preparations of different regions are listed for your reference in Annexure 2. You will find this discussion relevant for lactation also.

**What should be the meal pattern?**

To meet the increased demands of pregnancy, it is clear that the food intake increases. The question now is how to increase the daily food intake? Well, that's simple. To begin with, one can try increasing the amount of food normally eaten at each meal. For instance, in a meal (i.e lunch) consisting of chapati/rice/dal/ vegetable/curd one could increase the number of chapaties or the amount of rice or increase the amount of dal/vegetables normally consumed. If possible, one could include a little more curd. But it is generally observed that pregnant women cannot eat much at one time because of the various digestive changes that occur during pregnancy. *The only alternative then is to provide small but frequent meals.* The meal frequency i.e. the number of meals consumed in a day, would increase so as to accommodate the increased food intake. In addition to the three main meals i.e. breakfast, lunch and dinner, some other foods/food preparations (like those suggested in Annexure 2) must be included in the daily diet at different times of the day - say mid-morning, mid-afternoon, tea time. The number of meals consumed would, however, depend on the income of the individual. Some alternatives are given in the following lists:

| A                | B                  | C                  |
|------------------|--------------------|--------------------|
| Breakfast        | Breakfast          | Bed tea            |
| Mid-morning meal | Mid-morning meal   | Breakfast          |
| Lunch            | Lunch              | Mid-morning meal   |
| Tea              | Mid-afternoon meal | Lunch              |
| Dinner           | Tea                | Mid-afternoon meal |
|                  | Dinner             | Tea                |
|                  |                    | Dinner             |
|                  |                    | Bed time           |

- A) 4-5 meals/day pattern is likely to be followed by a low income group pregnant woman
- B) 5-6 meal/day pattern is likely to be adopted by a middle income group pregnant woman
- C) 6-7 meal/day pattern is typical of the high income group.

Remember, *whatever be the income group, the idea is to provide small but frequent meals during pregnancy.*

### What are the other specific considerations?

During pregnancy certain digestive changes commonly occur. You studied earlier that during the early weeks of pregnancy nausea, and/or vomiting is common, especially in the early morning. This is referred to as morning sickness. Similarly heartburn and a feeling of fullness or heaviness is common and sometimes troublesome especially in the third trimester of pregnancy. The occurrence of constipation during the second half of pregnancy, is also common. All these changes cause a lot of stress and discomfort to the woman. How to overcome this discomfort? Certain changes in the eating habits, meal pattern and the kind and amount of foods selected need to be made. Here are simple tips on how to deal with these situations.

- i) To overcome *morning sickness* one should provide carbohydrate-rich foods/ food preparations like biscuits, rusks, bread etc to the woman early in the morning (preferably with bed tea). In addition, foods which have a strong odour and flavour or those which leave a taste long after being eaten should be avoided.
- ii) To overcome *heartburn* or the feeling of heaviness/fullness, one should restrict eating fatty or fried foods. One would also benefit by not eating much at one time. Rather one should eat small frequent meals, as discussed earlier.
- iii) To prevent *constipation* one should take plenty of fibre-rich foods and adequate amounts of fluid in the diet:
  - Foods like vegetables (specially green leafy vegetables), whole grain cereals/pulses (like wheat, bengal gram, black gram, horse gram) are rich sources of fibre. More of these foods should be included in the diet. But at times it is observed that certain fibre-rich foods, especially whole pulses like black gram and cauliflower among vegetables, when consumed, produce a lot of gas in the body. This causes considerable discomfort. It is suggested that the use of these foods should be restricted, but, only if not tolerated.
  - Water (at least four to six glasses) and other drinks/beverages such as milk, buttermilk, coconut water, lime juice etc. should be taken in-between meals so as to help in the movement of food through the digestive tract, thus preventing constipation.

Simple tips on how to ensure a safe, comfortable pregnancy are listed in points to remember.

| <b>POINTS TO REMEMBER</b>  |  |        |  |
|--|--|--------|--|
| Pregnancy  |  |        |  |
| DO'S   |  | DON'TS |  |
| 1. Ensure that the pregnant woman attains adequate weight gain (i.e. 10-12 kg) during pregnancy  | 1. Avoid serving too much food at one time (one meal)  |        |  |
| 2. Include more of cereals, milk and milk products, pulses/nuts/sprouted grains and green leafy vegetables in the diet of pregnant women | 2. Avoid the consumption of foods with strong flavours |        |  |
| 3. Give iron/folic acid tablets right from the second trimester onwards  | 3. Restrict the use of spicy, fried and fatty foods    |        |  |

## Meal Planning

|   |  |
|---|--|
| 4. Use iodised salt for cooking   | 4. Discourage the pregnant woman from smoking or consuming alcoholic beverages |
| 5. Give small, but more frequent meals during the day   | 5. Avoid giving drugs except when prescribed by a doctor                       |
| 6. Provide nutritious snacks in between meals   | 6. Avoid serving too much of tea or coffee                                     |
| 7. Serve biscuits, rusk or any other carbohydrate rich food items early in morning to prevent morning sickness. | 7. Discourage the pregnant woman from doing strenuous heavy work               |
| 8. Include fibre-rich foods and plenty of water in the diet to relieve constipation                             | 8. Avoid excessive weight gain during pregnancy                                |
| 9. Encourage the women to drink fluids between meals rather than with them                                      | 9. Do not curtail the diet of the pregnant woman even for a short while        |
| 10. Encourage the women to do a few simple exercises daily.   |  |
| 11. Ensure that the pregnant woman takes adequate rest after each meal  |  |

### Check Your Progress Exercise 2

- 1) List any four dietary modifications that need to be made in the diet of a woman during pregnancy.

.....

.....

.....

.....

.....

- 2) Fill the blanks.

- a) Eating ..... rich foods can prevent morning sickness during pregnancy.
- b) ..... and ..... combination provides proteins of good quality.
- c) A pregnant woman should have more of foods rich in ..... and .....
- d) During pregnancy ..... and ..... meals should be given.
- e) To overcome the feeling of heaviness during pregnancy avoid eating ..... and ..... foods.

## 8.3 LACTATION

Lactation is the period following pregnancy when the woman nourishes a fully developed and a rapidly growing baby with breast milk. Most of the nutrients required by the baby are supplied by the breast milk.

A lactating woman secretes about 500 ml of milk/day in the first month. This amount increases to about 1 litre/day by the fifth month. On an average, a well-nourished lactating woman *secretes about 850 ml milk/day*. But there usually are individual variations. The nutrient composition of the milk secreted is as indicated in Table 8.2.

**Table 8.2 : Nutrient Composition of Human Milk**

| Nutrient          | Amount in human milk (per 100 ml) |
|-------------------|-----------------------------------|
| Energy (Kcal)     | 65                                |
| Proteins (g)      | 1.1                               |
| Carbohydrates (g) | 7.4                               |
| Fats (g)          | 3.4                               |
| Calcium (mg)      | 28                                |
| Iron (mg)         | —                                 |
| Carotene (µg)     | 137                               |
| Thiamine (mg)     | .02                               |
| Riboflavin (mg)   | .02                               |
| Niacin (mg)       | —                                 |
| Vitamin C (mg)    | 3                                 |



**Source:** *Nutritive value of Indian foods* by C. Gopalan, B.V. Rama Sastri and S.C. Balasubramanian,; revised and updated by B.S. Narasinga Rao, Y.G. Deosthale and K.C. Pant, National Institute of Nutrition (1989)

All these nutrients contained in breast milk are derived from the mother's body. Lactation, therefore, makes considerable nutritional demands on the woman. In fact, it imposes great strain on the woman, even more than in pregnancy. The mother's diet and state of nutrition influence the composition and output of milk produced. Extra nutrients should be provided during lactation so as to help the mother secrete enough milk and maintain an adequate level of nutrients. Let us now learn how much of which nutrients need to be provided during lactation.

### 8.3.1 Recommended Dietary Allowances for the Lactating Woman

The recommended dietary allowances for the lactating woman are listed in Table 8.3.

**Table 8.3: Recommended dietary intakes for the lactating women**

| Nutrient            | RDA's                   |                          |
|---------------------|-------------------------|--------------------------|
|                     | 0-6 months of lactation | 6-12 months of lactation |
| Energy (Kcal) [EAR] | +600                    | +520                     |
| Proteins (g)        | +17                     | +13                      |
| Calcium (mg)        | 1200                    | 1200                     |
| Iron (mg)           | 23                      | 23                       |
| Zinc (mg)           | 14                      | 14                       |

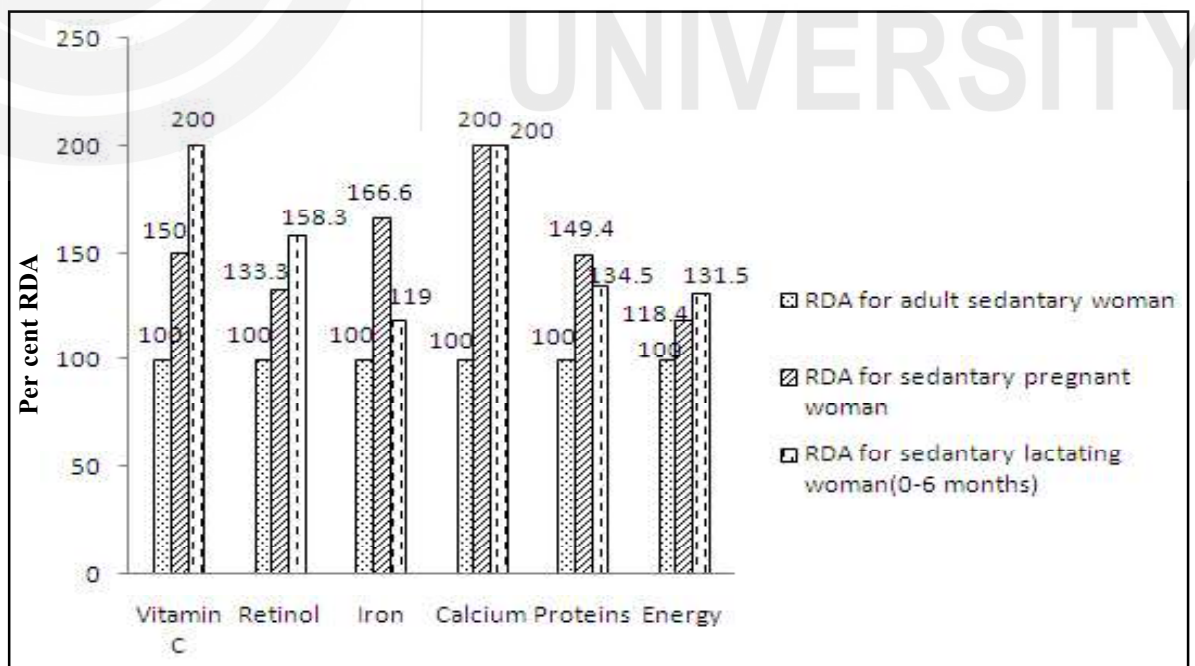
## Meal Planning

|                               |      |      |
|-------------------------------|------|------|
| Vitamin A (mcg)               |      |      |
| Retinol or                    | 950  | 950  |
| β-Carotene                    | 7600 | 7600 |
| Thiamine (mg)                 | 2.1  | 2.1  |
| Riboflavin (mg)               | 3.0  | 2.9  |
| Niacin (mg)                   | +5   | +5   |
| Ascorbic acid (mg)            | +50  | +50  |
| Folic acid (mcg)              | 330  | 330  |
| Vitamin B <sub>12</sub> (mcg) | +1.0 | +1.0 |

**Source :** Nutrient Requirements and Recommended Dietary Intakes for Indian, ICMR (2020).

The nutrient requirements increase considerably during lactation. In Table 8.3 you would have noticed that RDAs are given for two stages—0-6 months and 6-12 months of lactation. The nutrient need during the first six months is much higher than the 6–12 month stage. This is so because during the first six months the amount of milk secreted is the most. By six months lactation reaches its peak and, thereafter, the milk output starts decreasing gradually and so does the nutrient need.

The RDAs for energy and B vitamins are given in terms of additional allowances and for all other nutrients as total intake. A woman during lactation requires 600 Kcal in the first six months and 520 Kcal during the 6-12 months stage, in addition, to her needs prior to pregnancy and lactation. This represents 27-31 per cent increase in energy needs. Figure 8.6 illustrates the per cent increase in the nutrient need of a lactating woman as compared to a pregnant and non-pregnant woman. In Figure 8.6 the recommended dietary allowances of non-pregnant/non-lactating sedentary woman is taken as 100 per cent. One important thing to keep in mind is that the activity level of the lactating woman should be considered (sedentary, moderate or heavy work) before deciding on her energy requirement.



**Figure 8.6:** Per cent increase in the nutrient need of pregnant and lactating woman

In addition to energy, the need for proteins, calcium, vitamin-A and vitamin C is considerably high during lactation. The growing infant needs sufficient amount

of these body-building and protective nutrients for rapid growth of tissues. The infant takes all these nutrients from mother's milk. Hence, the diet of the lactating woman should contain plenty of these nutrients.

What food to include in the diet to help meet the nutrient need, is what we are going to learn in the next section.

### Check Your Progress Exercise 3

- 1) Fill in the blanks.
  - a) On an average ..... ml of milk is secreted per day during lactation.
  - b) A sedentary woman would require a total of .....Kcal during the first five months of lactation .
  - c) ..... and.....are the two nutrients, the requirement for which increases during lactation.
  - d) Adequate amount of ..... should be included in the diet so as to help maintain milk secretion.
  - e) The mother's diet influences the ..... and ..... of milk secreted.

### 8.3.2 Meal Planning for the Lactating Woman

The mother's nutrition is a key to successful breastfeeding and therefore the baby's health. One should pay attention to the fact that the nutrient need increases during lactation and, therefore, the woman needs to eat more food, in fact, even more than during pregnancy. The kind of foods eaten during lactation would be similar to that consumed during pregnancy, but with additional energy and protein intake to maintain lactation.

Some general considerations we should keep in mind while planning meals for lactating women are discussed in this section.

#### Whom are we planning for?

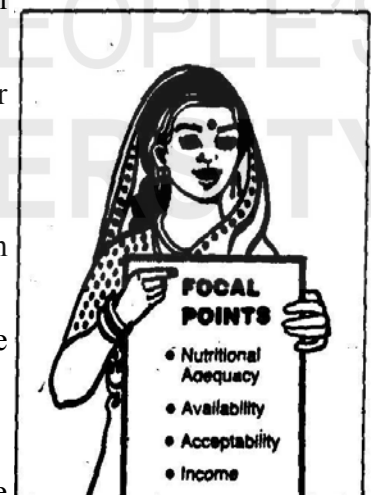
- Is the woman in the first six months of lactation or is she in the 6-12 month stage?
- Does the woman belong to low income group, middle income group or the high income group?
- Where does the woman live?

Based on this information first list the nutrient requirement and then decide on the right kind of foods to be included in the meals.

#### Which nutrients are of particular importance?

In general, the requirement for almost all nutrients increases during lactation. But the diet should provide more of the following:

- energy-giving nutrients (carbohydrates and fats)
- proteins
- calcium
- vitamin A and



- vitamin C

The requirement for *energy and protein during the first six months of lactation is comparatively much more than the next six months*. While planning, one should take this aspect, into consideration.

### Which foods to select?

In general, to provide an adequate well balanced meal during lactation, include atleast one food item from each of the three food groups – energy-giving, body-building and regulatory/protective.

But you are aware that the requirement for energy, proteins, calcium, vitamin A and vitamin C (among the protective nutrients) is particularly high during lactation. Hence provide more of the following foods (Figure 8.7):

- a mixture of *cereals* (i.e. wheat, rice, bajra, millets, jowar, ragi or any other staple commonly used)
- *pulses* and *meat/fish/egg*, if acceptable
- *milk* and *milk products* (like curd, cottage cheese, khoa etc.)
- *green leafy vegetables* (like amaranth leaves, mustard, fenugreek leaves, colocasia leaves etc.)
- *other vegetables* (especially yellow or orange coloured vegetables like carrots, pumpkin etc.)
- *seasonal fruits* (specially citrus fruits like oranges, lemons, limes, and others like guava, pineapple, mango, papaya etc.) and
- *nuts/oilseeds* (groundnuts, gingelly seeds, coconut etc.)

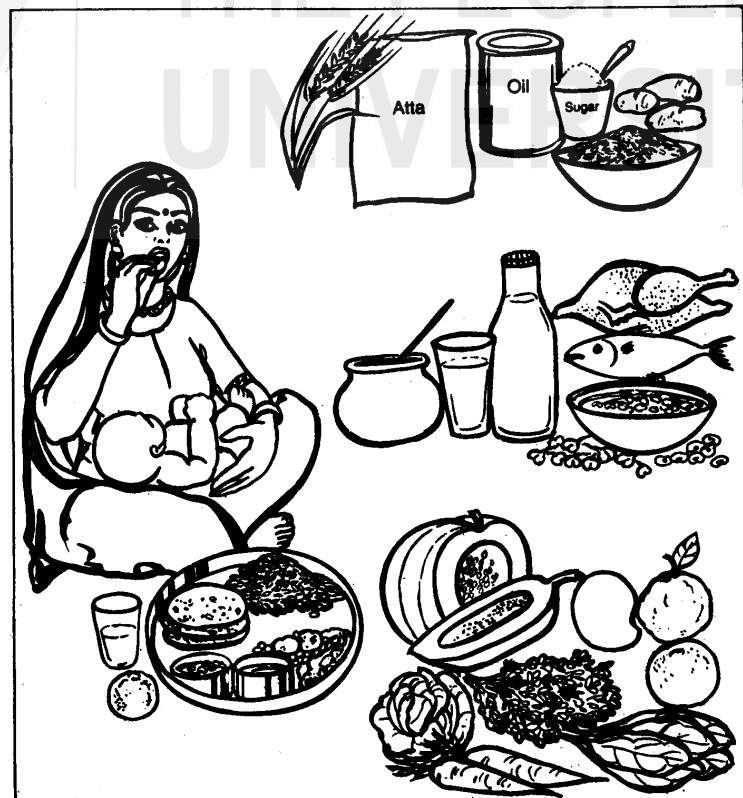


Figure 8.7: Foods to emphasize during lactation



It is important to mention here that the kind and amount of food selected for the meals should be according to the income of the individual. How to plan nutritious meals at low cost has already been discussed earlier in Unit 7. Plan meals keeping those points in mind. A lactating woman should consume at least a minimum of 500 ml milk/day or preferably more. In case of lactating women belonging to lower income groups a minimum of 325 ml milk/day must be ensured.

### What should be the meal pattern?

To help meet the increased nutrient requirements, the lactating woman needs to increase the amount of food normally eaten in a day. To begin with, she should continue to eat the same balanced diet that was eaten during pregnancy i.e. chapati/rice, dal, curd, green leafy vegetables, and other seasonal fruits, vegetables. In addition, certain snacks/food preparations (like those suggested in Annexure 2) should be served at different times of the day i.e. mid-morning, mid-afternoon, tea time. This will help meet the increased nutrient requirement. The number of meals consumed in a day should be increased during lactation. A 5-6 meal pattern could be followed such as breakfast, mid-morning meal, lunch, mid-afternoon meal, tea and dinner.

### What are the other specific consideration?

- i) Along with the increased food intake, *the fluid intake should also increase during lactation*. Increased fluid intake is recommended so as to help in maintaining an adequate supply of breast milk. Liquids in the form of juices, tea, milk, milk-based beverages, lime juice, coconut water etc. should be provided in-between meals or whenever desired. Plenty of water (at least 4-6 glasses daily) should also be provided. All these liquids i.e. water, drinks, beverages add to the fluid intake necessary to produce milk.
- ii) It is observed that during lactation no specific food needs to be omitted from the diet. A lactating mother can eat whatever nutritious food she chooses. But if she suspects a particular food of causing some discomfort to the infant she can eliminate that food from her diet. *Food with strong or specific flavour may alter the taste of breast milk. Use of such foods may, therefore, be restricted.*
- iii) Some substances like alcohol, drugs etc. can enter the breast milk and

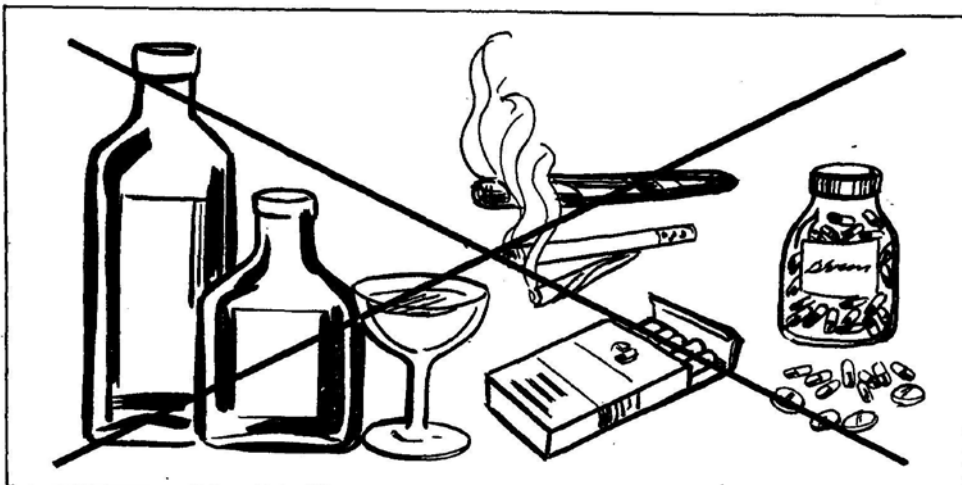


Figure 8.8: Substances to be avoided during pregnancy/lactation

Simple tips on how to ensure successful lactation are listed under points to remember.

| <b>POINTS TO REMEMBER</b>   |  |
|---|--|
| <b>Lactation</b>  |  |
| <b>DO'S</b>   | <b>DON'TS</b>  |
| 1. Include generous serving of milk, citrus fruits, green leafy vegetables and whole grains in the diet | 1. Discourage the lactating woman from smoking or consuming alcoholic beverages  |
| 2. Provide plenty of water and fluids (about 3 litres) to maintain adequate supply of breast milk       | 2. Do not give drugs except when prescribed by the doctor  |
| 3. Continue iron supplementation for a few months after child birth.                                    | 3. Restrict the use of foods with strong flavour   |
| 4. Increase the meal frequency to 5-6 meals a day   | 4. Avoid serving highly seasoned or spicy foods  |
| 5. Increase the quantity of food eaten at one time  | 5. Discourage the lactating woman from breast feeding if she is suffering from chronic illness such as cardiac disease, tuberculosis, severe anaemia, kidney disorder or mental disorder |
| 6. Provide nutritious food preparations/snacks in-between meals   |  |
| 7. Provide sufficient rest to the mother  |  |
| 8. Encourage frequent sucking to produce enough milk for the baby's need                                |  |
| 9. Ensure that the women is not emotionally disturbed during lactation                                  |  |

**NOTE: LOOK UP SECTION 6 OF THE PRACTICAL MANUAL - PART-I FOR DIETS FOR PREGNANT AND LACTATING WOMEN.**

**Check Your Progress Exercise 4**

- 1) A snack made of cereals/pulses/green leafy vegetables/oil/nuts is given to a lactating woman. List the major nutrients that would be provided by this nutritious snack. Suggest any two snacks/food preparations suitable for lactating women.

.....

.....

.....

.....

- 2) List any four dietary considerations that should be kept in mind while planning meals for lactating women.

.....

.....

.....

---

## 8.4 LET US SUM UP

---

In this unit you studied about the period of pregnancy and lactation.

Pregnancy, you learnt, is a period of about 9 months (divided into three trimesters i.e. 0-3; 3-6; 6-9 months) during which the foetus i.e. the unborn baby, grows inside the mother's body. Rapid growth and development of the foetus takes place during this period. To support the growth of the foetus certain changes in the mother's body also take place. Due to the rapid growth of the foetus and the mother's tissues the nutrient requirement of women increases. To help meet the requirement certain quantitative and qualitative changes need to be made in the diet of the pregnant woman which include the following: a well balanced diet containing food items from the three food groups should be provided. The amount of food consumed should be increased. Plenty of energy/protein, calcium and iron-rich foods should be included in meals. Small but frequent meals should be provided. All fatty foods or strongly flavoured, spicy foods should be avoided. Plenty of water and other fluids should be consumed.

Lactation, on the other hand, is the period following pregnancy, when the mother breastfeeds her infant. On an average 850 ml of milk/day is secreted during lactation. The mother's milk is a rich source of most nutrients for the infant, and because these nutrients are supplied only by her body, her nutritional requirements are high, in fact, even higher than during pregnancy. To accommodate this increased intake certain modifications need to be made in the meals of the lactating woman: a well balanced diet including foods from the three major food groups should be provided. More of energy, protein and protective nutrients such as calcium, vitamin A, vitamin C should be included in the diet. The food intake should be considerably increased and in addition to the three main meals some snack should be served in-between meals. Plenty of water and other fluids should be provided so as to help maintain adequate milk secretion.

---

## 8.5 GLOSSARY

---

- Anganwadi** : Anganwadi is the centre (focal point) at which the delivery of services under the Integrated Child Development Services (ICDS) takes place.
- Foetus** : The unborn baby growing inside the mother's body.
- Heartburn** : Heartburn is a burning sensation experienced in the lower area of the heart.
- ICDS** : Integrated Child Development Services (ICDS) is a programme providing a package of services namely supplementary nutrition, non-formal preschool education, health check-up, immunization, referral services, nutrition and health education to children below six years and to pregnant and lactating women.
- Maternal** : Refers to the mother.

- Meal Frequency** : Refers to the number of meals consumed in a day
- Physiological Changes** : Changes in body composition, organ function and physical performance are referred to as physiological changes.
- Reserves** : Refers to the nutrient stores in the body.
- Trimester** : A trimester is a three-month span of time
- 

## **8.6 ANSWERS TO CHECK YOUR PROGRESS EXERCISES**

---

### **Check Your Progress Exercise 1**

- 1)
  - a) False; the foetus grows in an organ called the uterus.
  - b) True
  - c) False; the haemoglobin level falls during pregnancy.
  - d) False; a woman who gains around 10-12 kg weight during pregnancy will give birth to a healthy baby.
  - e) False; the foetus accumulates abundant stores of iron during pregnancy.
  - f) False; the requirement increases from the second trimester onwards.
  - g) False; the requirement for B vitamins increases based on the increase in the energy requirement.
  - h) True
- 2) Pregnancy is the period during which the foetus grows inside the mother's body. The material tissues are also being formed to support this foetus. These rapid changes taking place necessitate increase in food intake. Increased amounts of nutrients are required to nourish the growing foetus, as well as, to meet the needs of the mother.

### **Check Your Progress Exercise 2**

- 1) List any four of the following:
  - Increase the number of meals consumed in a day.
  - Avoid fatty, spicy or strongly flavoured foods.
  - Include adequate roughage in the diet to avoid constipation.
  - Provide plenty of water.
  - Include more of cereals, pulses, milk, green leafy vegetables in the diet of the pregnant women.
  - Include nutritious snacks/foods preparations in-between meals.
  - Serve carbohydrate-rich food items early in the morning to prevent morning sickness.

- 2) a) carbohydrate b) cereal, pulse c) Any two of the following—energy/ protein/ iron/calcium d) small, frequent e) fatty, fried

**Check Your Progress Exercise 3**

- 1) a) 850 b) 2500 c) Any two of the following—vitamin A/energy/protein/ calcium vitamin C d) fluids e) amount, composition.

**Check Your Progress Exercise 4**

- 1) Energy, proteins, iron, calcium, vitamin A. Answer from your own experience.
- 2) List any four of the following:
- Small frequent meals should be provided.
  - Energy/protein-rich snacks should be included in between meals.
  - Extra fluids should be given so to help maintain adequate milk secretion, Fluids like juices, coconut-water, milk etc. should be given.
  - Include more of cereals, pulses, milk, citrus fruits, green leafy vegetable, orange and yellow fruits and vegetables in the meals.
  - Increase the meal frequency to 5-6 meals a day
  - Restrict the use of foods with strong flavour.