LACTATION

- The nutritional link between the mother and the child continues even after birth. Child is breastfeed for 6-9 months. The mother has to nourish a fully developed and rapidly growing infant; she needs extra nutrients to meet the baby's need in addition to her own requirements.

- FACTORS AFFECTING LACTATION:

- Neuroendocrine factors: Suckling by the infant and the continous emptying of the breasts provide the necessary neuroendocrine stimulation which is important to maintain the physiological process of lactation. Breast feeding is itself a stimultant for further production of milk.
- Nutritional factors: poor nutrition of the mother definitely affects the quantity and quality of milk. A well balanced nutritious diet is, therefore of extreme importance for the mother to provide enough milk for the child as well as to maintain her own health and nutritional status.
- Psychological factors: emotions like fear, anxiety, worry, grief, or anger may retard milk secretion the mother must, therefore, regard lactation as a pleasant experience and not as a binding or imposition on her. Even the cry or the thought of the baby may lead to milk ejection due to related emotions.
- Social factors: social value, Urbanization and industrialization, change in attitudes combined with the effect of advertisements and mass media related to the availability of convenient infant formulae which have a negative effect on breast feeding practices

NUTRITIONAL REQUIRMENTS

- **ENERGY:** lactating mother needs additional energy for the production of milk. Therefore during the first 6 months of lactation additional energy recommended is 550kcal/day. While after 6 months milk output is reduced, an extra allowance of 400kcal/day is recommended (6-12 months). The additional energy for lactation is drawn from maternal adipose tissue stores laid down during pregnancy.
- **PROTEIN:** protein needs also increases as milk contains 1.15g of protein /100ml. mother secretes 850ml of milk during first 6 months and about 600 ml during 6 – 12 months. Therefore the recommended additional protein during lactation is 25g for 0-6 months and 18g for 6-12 months.
- **FATS AND ESSENTIAL FATTY ACIDS:** 45g of visible fat /day during lactation. The requirement of linoleic acid during lactation increases.
- **CALCIUM:** additional calcium is required for breast milk secretion therefore a daily intake of 1g calcium which covers the total calcium needs of the lactating mother.
- **IRON:** The iron requirements remain same as adult women of 30mg/day because the baby is born with the larger reserve of iron.

- **IRON:** The iron requirements remain same as adult women of 30mg/day because the baby is born with the larger reserve of iron.
- **VITAMIN A:** a lactating mother needs ample amount of vitamin A (retional). 950ug of retional or 3,800ug of B-carotene per day for a lactating mother up to 1 yr of lactation is recommended.
- **VITAMIN B:** as calorie and protein requirements are increased during lactation, B vitamin requirements are also increased.
- **RIBOFLAVIN:** maximum amount of riboflavin is excreted through milk therefore extra amt. has to be met through diet. Increased energy allowance would be sufficient to cover the amount of riboflavin secreted in the mother's milk.
- **ASCORBIC ACID (VITAMIN C):** an additional intake of 40mg ascorbic acid/day during lactation i.e. a total of 80 mg of ascorbic acid /day.
- **FLUID:** an increased intake of fluids is necessary for adequate milk production. Water and beverages such as juices, tea, coffee and milk should be consumed.

RECOMMENDED DIETARY ALLOWANCES

	Non pregnant	Pregnant	Lactation (0 – 6 months)	Lactation (6 – 12 months)
Net Calories	22 - 25 Calories	+ 300 Calories	+ 550 Calories	+ 400 Calories
Protein	50 g/d	50 + 15 g/d	+ 25 g/d	+ 18 g/d
Fats	20 g/d	30 g/d	45 g/d	45 g/d
Carbohydrates				
Ca	400 mg/d	1000 mg/d	1000 mg/d	1000mg/d
Iron	30 mg/d	38 mg/d	30 mg/d	30 mg/d
Vitamin A (Retinol)	600 IU	600 IU	950 IU	950 IU
Vitamin A (Beta-carotene)	2400 IU	2400 IU	3800 IU	3800 IU
Thiamine	1.1 mg/d	+ 0.2 mg/d	+ 0.3 mg/d	+ 0.2 mg/d
Riboflavin	1.3 mg/d	+ 0.2 mg/d	+ 0.3 mg/d	+ 0.2 mg/d
Nicotinic Acid	14 mg/d	+ 2 mg/d	+ 4 mg/d	+ 3 mg/d
Pyridoxine	2 mg/d	25 mg/d	25 mg/d	25 mg/d
Vitamin C	40 mg/d	40 mg/d	80 mg/d	80 mg/d
Folic Acid	100 mg/d	400 mg/d	150 mg/d	150 mg/d
Vitamin B 12	1 mg/d	1 mg/d	1.5 mg/d	1.5 mg/d
Vitamin D	5 mg (100 IU)	10 mg (400 IU)	10 mg (400 IU)	10 mg (400 IU)

COMPOSITION OF BREAST MILK:

- Nutritionally adequate but also easy to digest.
- Colostrum (first milk) is rich in antibodies, vitamin A, provide not only nutrition but also develop his immunity.
- A healthy mother secretes nearly 850ml of milk daily; her nutritional needs are increased enormously.
- Breast milk contains a fatty acid called docosahexaenoic acid (DHA), which is essential for your baby's vision and brain development. One important source of DHA is fish. The content of DHA is very low in vegetarian sources of diet. The DHA content in Indian food is low as it is mainly vegetarian

Table 7.5 Nutrient Composition of different Milks/100g

Milk	Energy (kcal)	Protein (g)	Carbohydrate (g)	Fat (g)	Calcium (g)
Breast milk	65	1.1	7.4	3.4	28
Cow's milk	67	3.2	4.4	4.1	120
Buffalo's milk	117	4.3	5.0	6.5	210
Toned milk	58	3.2	4.7	3.0	118

- Vitamin A
- Vitamin D
- Vitamin C
- Vitamin E
- Vitamin B1 (thiamin)
- Vitamin B2 (riboflavin)
- Pantothenic acid
- Biotin
- Niacin
- Folic Acid
- Vitamin B12
- Vitamin B6

Factors Affecting The Volume And Composition Of Breast Milk

- 1) **Maternal nutrition status:** fat and energy concentration in milk are significantly related to fat stores.
- 2) **Parity:** (state of having given birth to an infant): milk of primiparae has a higher fat concentration than that of multiparae. (woman who has given birth two or more times)
- 3) **Supplementary feeding**: no significant effect of supplementary feeding on the production of milk.
- 4) **Infant demand**: the frequency of milk removal is an important determinant of the volume of milk secreted. Suckling stimulates the release of hormones that stimulates milk production.
- 5) Undernourished mother produces less quantity but same quality of milk.
- 6) Lactose, protein, calcium, iron, copper and fluorine content of milk is independent of the mother's diet.
- 7) Selenium, iodine, and B vitamins content of milk are dependent on mother's diet.
- 8) Lactation capacity is a function of genetic heritage.
- 9) Maternal physical activity, the thermic effect of food or maternal and infant illness may affect the amount and content of milk.

DIET AND FEEDING PATTERN:

- Nutritional requirements are maximum during lactation compared to any other age group in woman's life hence diet should be balanced and meet the requirements. Increase the no. of meals some foods should be given in between the main meals (5-7meals in a day).
- Intake of fluids should be increased as fluids are essential for adequate milk production.
- Additional energy yielding foods .
- Additional amount of fat which provide energy and vitamin A.
- They are also given special preparations having ajwain, methi seeds, saunth, til seeds etc. which supply protein, iron, calcium and B-group vitamins called galactagogues (food that help to produce more milk).
- Since some of the medicines can be absorbed into the mother's blood stream and may be secreted in the milk, the use of any medicine during lactation should be strictly under medical supervision.