

# INFANT FEEDING



**Dr. Chetana Donglikar**

Department of Home Science

Kalikadevi College Shirur (ka) Dist Beed

28 12 2009

# Nutrition I

## OBJECTIVES

- By the end of this lecture you will be able to know the followings:
- Breast feeding ; advantages ; Physiological mechanisms; Contraindications; and Problems associated with breast feeding.
- Bottle feeding; types of milk; calculation of the amount /feed; difference between cow's milk and human milk.
- Weaning and foods avoided for infants and young children.

# BREAST FEEDING

## Physiological Mechanisms

### 1- Maternal reflexes

**a. Prolactin reflex** : as the baby suckles, impulses pass from the areola up to the hypothalamus then to the anterior pituitary producing prolactin which makes the breasts produce milk.

**b- Oxytocin reflex** (let-down reflex): suckling also stimulates the production of oxytocin by the posterior pituitary. Oxytocin causes contraction of the smooth muscles surrounding the alveoli, squeezing milk out.

### 2- Infant`s reflexes

**a. Rooting reflex** : If the circumoral area or cheek of the infant are touched by the nipple, leads to turning of the head to the side on which the nipple is felt and the infant draws it into his opened mouth.

**b. Suckling reflex**: The tactile stimulus caused by the nipple and areolar tissues filling the mouth lead to milking action by the tongue against the hard palate..

**c. Swallowing reflex**: This enables the baby to ingest the milk that is obtained by suckling, and allows interruption of breathing to prevent choking during swallowing.

# Technique of Breastfeeding

**1- General cleanliness**

**2- Position:**

**a- The infant is held in a semi-sitting position.**

**b- The mother should be completely at ease.**

**c- The mother bends forwards so that her nipple finds its way into the infant's mouth after initiating the rooting reflex. A portion of the areola is taken into the mouth.**

**d- The nipple is steadied by the index and middle fingers of the free hand which also holds the breast away from the baby's nostrils.**

### **3- The end of a feed:**

a- This is determined by the infant who releases the nipple.

b- Prolonged suckling while the infant falls asleep and the breast is already empty should be discouraged.

c- After feeding, leave few drops of expressed breast milk to dry on the nipple..

### **Exclusive Breastfeeding:**

This means that the baby has no other food or drink but breast milk up to the age of 6 months.



# Advantages:

## 1-Composition:

**Breast milk is nutritionally superior to any alternative and is easily digestible.**

## 2-Convenience:

**Breast milk is ready to serve anytime and anywhere, supplied at the proper temperature and sterile.**

## •3-Anti-infective properties

**•Immunoglobulin (IgA):** More present in colostrum than in mature milk. IgA acts in the gut against bacteria and viruses.

**•Lysozyme and Lactoferrin :** they destroy harmful bacteria.

**•White blood cells:** these are abundant in breast milk in the first 2 weeks They secrete IgA, lysozyme, lactoferrin and interferon. The latter inhibits certain viruses.

• **Bifidus factors:** this is necessary for growth of lactobacillus bifidus bacteria which produce lactic acid that interferes with the growth of harmful bacteria.

**4. Anti-allergic:**

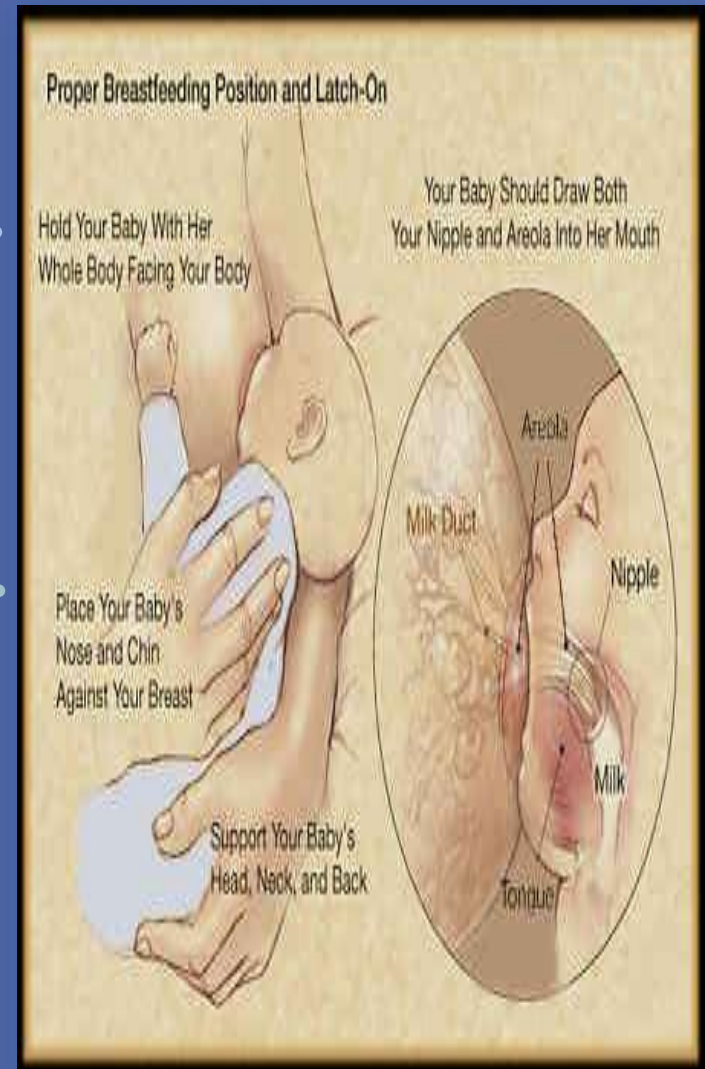
**Allergy to breast milk is practically nonexistent. Breast milk gives partial protection against some allergic conditions e.g. infantile eczema.**

**5. Psychological:**

**Breastfeeding is a satisfying experience for both mother and infant, the mother feels a sense of accomplishment, the infant is afforded close and comfortable physical and sensual contact essential for his emotional development.**

# DIFFICULTIES OF BREAST FEEDING

- 1- Suckling in a poor position.
- 2- Insufficient Breast Milk.
- 3- Delayed Appearance of Milk.
- 4- Inability to Suckle or Refusal of Breastfeeding.
- 5- Engorgement.
- 6- Fissured or Cracked Nipples.
- 7- Flat or Retracted Nipples.
- 8- Regurgitation after Breastfeeding.
- 9- Work and Breastfeeding:





# **Absolute contraindications of breast feeding:**

## **Causes related to the infant:**

Inborn errors of metabolism as galactosemia and phenylketonuria.

Errors of digestion as monosaccharides and disaccharides intolerance.

## **Maternal causes:**

### **Maternal hepatitis B:**

Unless the newborn receives Hepatitis B immune globulin and Hepatitis B vaccine at birth, and then completes the hepatitis B vaccination schedule.

### **Maternal HIV/AIDS:**

Breast-feeding is not recommended if a safe alternative is available.

### **Intake of dangerous toxic drugs:**

which are secreted in milk in considerable amounts:

Anticoagulants, antineoplastics (cyclophosphamide, cyclosporine, etc.), thiouracil, ergotamine, phenindione and lithium,

### **Radioactive substances:**

Cocaine, heroin, marijuana

# Temporary Contraindications:

## Causes related to the infant:

Severe cleft palate, microgenathia.

**Infant infections:** Oral herpes simplex.

## Maternal causes:

Psychosis, neurosis and epilepsy. Eclampsia.

## Maternal infections:

**Herpes :** simplex lesions on the breast (until healed).

**Chicken pox:** Zoster immune globulin (ZIG) is given to non infected neonate. The neonate is separated from the mother until she is no longer infectious.

**Active tuberculosis:** Mother is treated. Infant receives INH and is repeatedly tested with tuberculin test. INH is discontinued if tuberculin is still negative after 3-4 months of age and the mother response to treatment is satisfactory.

**Breast abscess:** No feeding from the affected breast until healed.

**Septicemia:** typhoid fever, pneumonia until treated.

## Difference between human milk and cow's milk:

**Protein:** ( 1 gm compared to 3.5 gm/100ml) Human milk contains a higher proportion of soluble whey protein (lactalbumin and lactoglobulin) than casein. For soft easily digestible curd .

**Fat:** (4 gm compared to 3.9 gm/100ml) Lipase enzyme is present to help digestion. Sufficient amount of the essential fatty acid linoleic acid is present. Fat globules are small and easily digestible. High level of arachidonic acid and cholesterol essential for brain development.

**Lactose:** (7.4gm compared to 4.9gm/100ml) Some lactose is converted in the intestine to lactic acid which prevents growth of pathogenic bacteria and also helps calcium absorption.

**Minerals:** (0.2 gm compared to 0.8gm/100ml) The ash content is low to avoid any excess osmolar load and renal solute load. The calcium/phosphorus ratio is optimal for absorption Iron absorption and utilization are efficient.

**Vitamins:** If the mother's diet is adequate, her milk will satisfy all the vitamin requirements during the first 4-6 months of life. The amount of vitamin D in breast milk is small but is efficiently utilized as antiracists factors.

# Breast Milk Substitutes (Formula)

## Substitutive:

Breast milk **NOT** given and is completely replaced by milk formula as in:

1. Death of the mother.
2. Mother unwilling to breast-feed.
3. Failure of lactation: no or very little milk
4. Institutes and nurseries.

## Fresh Liquid Animal Milk:

It **NOT** suitable for feeding young infants (< 1 year) because they still contain microorganisms and still have huge biological differences from human milk:

- ❖ Raw fresh cow, buffalo, and goat milks.
- ❖ Pasteurized milk (pasteurization modifies the curd and kills some bacteria).
- ❖ UHT (ultrapasteurized), aseptically packed milk (that kept for several weeks).

## Modification "or Humanization" of fresh cow's milk:

Dilute milk with an equal amount of water, then Add sugar (5 grams for each 100 ml of diluted milk), then Mix well and sterilize the by boiling.

## Pasteurization:

This is a method of sterilization in which the milk is heated to 70°C for 30 minutes, then suddenly cooled in an ice chest to 5°C. Pasteurized milk should be boiled when used for infant feeding to alter the curd.

# General guidelines for the choice of a particular formula:

- ❖ For a normal baby: Better use an adapted "humanized" dry milk formula.
  - ❖ For special metabolic disorders or disease states: use appropriate special formula
  - ❖ In cases of diarrhea, there is usually no need to shift to lactose free formula except in lactose intolerance and after rotavirus diarrhea.
- The amount of formula needed is calculated according to weight as follows:  
Daily needs = 150ml formula/kg of body weight/ day, then  
The calculated amount is divided by the number of feeds per day (usually 6 feeds).

Amount feed (ml):  $\frac{150 \text{ ml} \times \text{Body weight in Kg}}{\text{Number of feeds per day}}$

Example: For a baby weighing 4 kgs. the daily needs is:  $150 \times 4 = 600$  ml/day. So if we give 6 feeds/day, the amount given in each feed =  $600 / 6 = 100$ ml.

## 2-Weaning and complementary feeding:

It means the introduction of semisolid and solid foods to the infant gradually.

**Complementary** feed means the provision of food or fruits in addition to breast milk.

### **When Weaning should start?**

Complementary feeding is usually initiated by the end of 6<sup>th</sup> month. If the weight gain of the baby is inadequate, it can be started at the end of the 4<sup>th</sup> month.



**There is a universal agreement that: complementary feeding;** Should not be started before the age of 4 months, and

➤ Should not be delayed beyond the age of 6 months afterwards the infant needs extra source of energy to maintain growth.-Foods rich in iron to replenish the store.

### **Aims of Complementary feeding:**

➤ The child cannot tolerate more than one liter of fluid per day. So, with increasing needs for energy ,solid foods should be added.

➤ Growing baby requires more minerals and vitamins which cannot be supplied by milk.

➤ To train the child on spoon feeding, chewing, and swallowing of solids.

➤ To train the gastrointestinal tract to digest starch and other solid foods.

➤ To educate the child independence by using spoon and cup to feed himself.



# Principles of Weaning and Complementary Feeding:

- Introduction of a new food item should be gradual to prevent gastrointestinal disturbances.
- Sudden weaning may predispose the young infant to a psychological trauma.
- Do not start a new food when the baby is sick or not doing well.





## **Technique of Weaning and Complementary Feeding :**

- **Gradually replace milk by foreign food till all milk feeds are replaced at age of 2years.**
- **The new food is given gradually and in small amounts at first (1-2spoon then increased).**
- **Amounts are determined by baby's appetite. Advice parents not over feed the babies.**
- **Never force the infant to take a new food.**
- **The presentation of food is important (colorful attractive spoons and plates).**
- **New food items should be introduced one at a time. Vegetables and non-sweetened foods should be introduced before sweetened foods to reduce the tendency to develop desire for sweets.**



## Foods to Avoid in Infancy:

- Foods that cause **choking**: nuts, potato chips, popcorn, fruits with seeds, fish with bones, tough meat, small hard candies.
- **Common allergy**- producing foods (specially in potentially atopic children): fresh milk and products made with milk, eggs, chocolate, cocoa, fish, tomatoes, berries, citrus fruits.
- **Food additives**: artificial colors and flavors. Salted foods: high sodium load on kidneys and may predispose to hypertension later in life.
- **Junk foods**: sweets, candies, pastry, soft drinks, artificially-flavored fruits drinks, and highly spiced food, fatty or fried foods.

Healthy  
Children  
Make A  
Healthy  
Nation

