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1.	Home Science	H.Sc. CC6	Feeding of LBW & Preterm Babies	PDF	Dr. Kumari Rupam	PG Dept. of H.Sc. MMC, PU, PAT

### **Feeding of Low Birth Weight (LBW) and Preterm Babies**

The incidence of LBW is about 30% (NFHS 2005). Majority of them continue to be small and add to the pool of malnutrition. The growth velocity is much higher in preterm than in term babies; but their nutrient stores are very little. The recommended dietary allowances (RDA) for preterms recommended by the European Society for Paediatric Gastroenterology and Nutrition (ESPGAN) is generally accepted.

#### **RDA for preterm babies**

No.	Item	Requirement
1	Energy	110-165 kcal/kg/day
2	Fluids	150-200 ml/kg/day
3	Protein	3-3.5 g/kg/day
4	Vit. A	1000 IU/day
5	Vit. D	400 IU/day
6	Vit. E	15 IU/day
7	Folic Acid	50 µg/day
8	Vit. C	10-60 mg/day
9	Calcium	100-200 mg/kg/day
10	Phosphorus	50-150 mg/kg/day
11	Magnesium	6-20 mg/kg/day
12	Zinc	1-2 mg/kg/day
13	Iron	2.5 mg/kg/day

Vitamins are advised 2 weeks after birth and iron after 6-8 weeks.

(Source: RDA of preterms, ESPGAN)

### 1. Protein

Protein intake up to 4g/kg is recommended; however, higher doses are shown to produce azotaemia, hypoglycaemia, hyperaminoacidaemia especially tyrosinaemia and metabolic acidosis. Protein is also rich in taurine and cysteine. Synthesis of taurine and synthesis of cysteine from methionine is defective in preterms

### 2. Fats

Fat malabsorption and steatorrhoea can occur in preterms due to reduced amounts of pancreatic lipase, carboxylic ester hydrolase, bile acids and lingual lipase. Bile salt stimulated lipase (BSSL) in Human milk promotes Fat absorption. Human milk contains adequate LCP for brain maturation. Carnitine facilitates transport of long-chain fatty acid across mitochondrial membrane for oxidation. Preterms have defective synthesis of carnitine. Human milk is rich in carnitine. Triglycerides are useful as they do not require hydrolase for digestion and absorption. Triglycerides increase Calcium, Magnesium absorption and tend to spare dietary Nitrogen as well.

### 3. Carbohydrate

Lactose enhances Ca and Mg absorption and ensures favourable bacterial flora. Premature infants have transitional lactose intolerance due to immature infant's system.

### 4. Energy and Fluid

110-165 kcal/kg/day is the recommended energy and 150-200 ml/kg/day is the recommended fluid. Fluid is started as 60-80ml/kg/day and is increased in increments of 10ml/kg/day.

### 5. Macrominerals/ Macroelements

The intake of Sodium, potassium, chloride, calcium, phosphorous and magnesium should be optimum. Magnesium deficiency may impair calcium homeostasis. Calcium and phosphorous supplements may be needed to prevent rickets and osteopenia in preterm.

### 6. Microminerals/ Trace Elements

Iron deficiency can occur by 6-12 weeks and hence 2.5 mg/kg/day of iron starting from 6-8 weeks of age may be given. Zinc supplementation has been shown to increase weight gain.

### 7. Vitamins

One dose of vitamin K 0.5-1 mg is beneficial in all LBW babies to prevent haemorrhagic disease of the newborn.

## 8. Choice of milk

Out of the various options, mother's own preterm milk is found superior. Others are banked milk, expressed breast milk, milk fortified with human milk protein by lacto-engineering and ordinary and special formula.

## 9. Human Milk Fortifiers (HMF) for preterm Babies

The nutritional composition of expressed breast milk can be insufficient to meet the high nutritional requirements of premature baby. Human milk fortifiers (HMF) are commercially available products that can be added to expressed breast milk (EBM). HMF contains protein or protein hydrolysate, fat, carbohydrate, sodium, calcium, phosphorous, copper, zinc, vitamins, etc. The HMF powder should be added in EBM, however, expression of milk is not always easy.

## 10. Mother-Infant Bonding

When the care of preterm/LBW baby is undertaken by third person, e.g., nurse, mother-infant bonding reduces. When the mother is the primary caretaker, mother infant bonding is established. Her bacteria will colonize on the baby. These bacteria will not generally cause infection in the baby unlike the bacteria of the caretaker. This is due to transplacental antibodies.

## 11. Catch-up Growth

In a full term baby, the catch up is about 200g/week after the first 10 days of life. Initially there is slight loss of weight and the birth weight is regained by 10 days. In preterm, the catch can be up to 10 times for the age or up to 5 times for the length. The preterm is expected to grow on par with the intrauterine growth or as per the corrected age.

Corrected age = Chronological age – Period of prematurity

## **Feeding of the LBW and Preterm Infants**

Exclusive demand feeding is best for preterm babies. Those who are not thriving well may need milk formula or human milk fortifiers(HMF). These are to be prescribed only when absolutely indicated and are to be given under supervision as collection of milk and mixing need extra care.

## **Route of Feeding**

Babies above 34 weeks gestation and weight above 1.8kg can be put to breast. In infants less than 34weeks gestation and less than 1500-1800h birth weight, start with gavage feeds and slowly switch over to oral feeding. EBM is always preferred. Up to 0.5 ml-1 ml/hour may be given to very immature babies to enhance gut maturation. Gravity assisted feeding in 10-20 min is preferred to bolus feeding from a syringe with piston. Large preterms can be initiated on feeding within two hours of birth. 60, 90,120,150 ml/kg/day can be given on the first four successive days. Up to 180 ml/kg/day on day 10 and 200ml/kg/day on day 14 may be achieved.

The initial feed may be distilled water followed by 5% glucose and then colostrum/expressed breast milk (EBM).

### **Feeding Schedule for LBW babies**

<b>Birth Weight</b>	<b>Quantity</b>	<b>Frequency</b>	<b>Increments</b>
< 1kg	1 ml	1-2 hr	1 ml/day
1-1.5 kg	2-3 ml	2-3 hr	1 ml/alt feed
1.5-2 kg	5-6 ml	2-3 hr	1-5 ml/feed
2-2.5 kg	8-10 ml	2-3 hr	5-10 ml/feed

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